



# Annual Update for the Historical Release Report



September 2000

# ANNUAL UPDATE

FOR AUGUST 1, 1999 THROUGH  
AUGUST 1, 2000

## HISTORICAL RELEASE REPORT (HRR)

**Prepared By**

**Kaiser-Hill Company, L.L.C.**

**Revision 0**

Document Classification  
Review Waiver per  
Classification Office  
CEX-010-98

## TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
ABBREVIATIONS, ACRONYMS, AND INITIALISMS .....	vi
1.0 INTRODUCTION.....	1
2.0 REVISED PAC NARRATIVES .....	11
PAC REFERENCE NUMBER NE-110 (Trench T-3)	12
PAC REFERENCE NUMBER NE-1404 (Diesel Spill at Pond B-2 Spillway)	15
PAC REFERENCE NUMBER NE-1409 (Interceptor Trench Pump House)	20
PAC REFERENCE NUMBER 100-607 (Building 111 Transformer PCB Leak)	26
PAC REFERENCE NUMBER 300-156.1 (Building 371 Parking Lot)	29
PAC REFERENCE NUMBER 500-169 (Waste Drum Peroxide Burial)	35
PAC REFERENCE NUMBER 600-164.1 .....	38
(Radioactive Slab from Bldg 776)	
PAC REFERENCE NUMBER 600-189 .....	42
(Nitric Acid Tanks)	
PAC REFERENCE NUMBER 600-1001(a) (Waste Oil Identified within PAC 600-1001)	46
PAC REFERENCE NUMBER 700-123.1 (Valve Vault 7)	49

PAC REFERENCE NUMBER 700-1102 (Transformer Leak-776-4)	55
PAC REFERENCE NUMBER 900-108 (Trench T-1)	59
PAC REFERENCE NUMBER 900-112 (903 Pad)	66
PAC REFERENCE NUMBER 900-140 (Hazardous Disposal Area)	75
PAC REFERENCE NUMBER 900-155 (903 Lip Area)	79
PAC REFERENCE NUMBER 900-183 (Gas Detoxification Area)	85
PAC REFERENCE NUMBER 900-1311 (Septic Tank East of Building 991)	92
PAC REFERENCE NUMBER 900-1318 (Release of F001 Listed Waste Water to Soil)	100
<b>3.0 SIGNIFICANT EVENTS (to date).....</b>	<b>109</b>
(Significant Events Occurring within Reporting Period)	
Operable Unit 1 CAD/ROD Amendment . . . . .	110
(Status of Field Work near IHSS 119 1 and Collection Sump)	

## FIGURES

Figure 1 1 PAC Area Boundaries	5
Figure 2 1 PAC NE-1404 Location Map	16
Figure 2 2 Sample Location Map for PAC NE-1409, (Interceptor Trench Pumphouse)	23
Figure 2 3 Sample Location Map for IHSS 300-156 1	31
Figure 2 4 Location Map and GPR Survey for IHSS 500-169	36
Figure 2 5 Sample Location Map for IHSS 600-164 1	39
Figure 2 6 Location Map and Survey Coordinates for IHSS 600-189	44
Figure 2 7 Sample Location Map and Results for IHSS 700-123 1	51
Figure 2 8 Location Map for PAC 700-1102	56
Figure 2 9 IHSS 108 General Location Map (Trench T-1)	60
Figure 2 10 IHSS 108 Sample Location Map (Trench T-1)	63
Figure 2 11 903 Pad, 903 Lip & Americium Zone Tier I & II Subsurface Contamination	69
Figure 2 12 903 Pad, 903 Lip & Americium Zone Tier I RSAL Exceedances	70
Figure 2 13 903 Pad, 903 Lip & Americium Zone Tier II RSAL Exceedances	71
Figure 2 14 900 Area, Groundwater Plume Contamination (VOCs)	72
Figure 2 15 IHSS 155 Boundary Revision (Based upon Tier II RSAL Exceedances)	82
Figure 2 16 Sample Location Map for PAC 900-1311	94
Figure A-3 Non-RFCA Generated Soils Returned to Place of Origin.	155

## TABLES

Table 1 1 RFCA Consolidation of Former Operable Units	3
Table 1 2 Status Table for IHSSs and PACs Updated this Reporting Period	7
Table 1 3 HRR Site Tracking and Status through September 25, 2000	10
Table 2 1 Summary Statistics for Station SW095, 1991 - 1992	21
Table 2 2 Summary of Results for PAC NE-1409	24
Table 2 3 IHSS 156.1 Surface Soil Analytical Results/RFCA Comparison	32
Table 2 4 IHSS 164 1 Surface Soil Analytical Results/RFCA Comparison	40
Table 2 5 IHSS 123.1 Maximum Detected Compounds/RFCA Comparison	52
Table 2 6 IHSS 140 1995 Analytical Results/RFCA Subsurface Soil Action Levels	76
Table 2 7 PAC 900-1311 Summary of Surface Soil Sampling Results	96
Table 2 8 PAC 900-1311 Summary of Subsurface Soil Sampling Results	97
Table 2 9 PAC 900-1311 Correlation Table for Characterization Samples	98
Table 3 1 IHSS 900-119 1 June 20, 2000 Groundwater Sampling Results	111

## APPENDIX(S)

Appendix 1 HRR Sites
Appendix 2 Correspondence
Appendix 3 Areas of (Non- RFCA) Soil Put-back
Appendix 4 Plates

5

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

ALF	Action Level and Standards Framework for Surface Water & Soils
AME	Actinide Migration Evaluation
AOC	Area of Concern
ARA	Accelerated Response Action
BGS	below ground surface
BTEX	benzene, toluene, ethyl-benzene, xylene
BZ	Buffer Zone
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment & Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
Ci	Curies
Cm <sup>2</sup>	square centimeters
CPIR	Contingency Plan Implementation Report
cpm	counts per minute
D&D	Decontamination and Decommissioning
dpm	disintegrations per minute
D/P/G	disintegrations per minute per gram
DNAPL	dense non-aqueous phase liquid
DOE	U S Department of Energy
EG&G	EG&G Rocky Flats, Inc
EPA	U S Environmental Protection Agency
ERA	Ecological Risk Assessment
ER	Environmental Restoration
FIDLER	Field Instrument for the Detection of Low-Energy Radiation
ft	foot/feet
ft <sup>2</sup>	square feet
FY	Fiscal Year
g	grams
GPS	Global Positioning System
GPR	Ground Penetrating Radar
HDPE	High Density Polyethylene
HI	Hazard Index
HEPA	High Efficiency Particulate Air
HHRA	Human Health Risk Assessment
HPGe	High Purity Germanium
HRR	Historical Release Report
IA	Industrial Area
IDM	Investigative Derived Materials
IHSS	Individual Hazardous Substance Site
IAG	Interagency Agreement
IM/IRA	Interim Measure/Interim Remedial Action

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS (continued)

IMP	Integrated Monitoring Program
IRIS	Integrated Risk Information System
ITS	Interceptor Trench System
ITPH	Interceptor Trench Pump House
IWCP	Integrated Work Control Package
$\mu\text{Ci/g}$	microcuries per gram
$\mu\text{g/Kg}$	micrograms per kilogram (ppb)
$\mu\text{g/L}$	micrograms per liter (ppb)
$\text{mg/Kg}$	milligrams per kilogram (ppm)
$\text{mg/L}$	milligrams per liter (ppm)
MDL	Method Detection Limit
MST	Modular Storage Tank
$\text{nCi/g}$	nanocuries per gram
NFA	No Further Action
NPWL	New Process Waste Lines
NRC	National Response Center
NTS	Nevada Test Site
OPWL	Original Process Waste Lines
OU	Operable Unit
PA	Protected Area
PAC	Potential Area of Concern
PAM	Proposed Action Memorandum
PARCC	Precision, Accuracy, Representativeness, Completeness, and Comparability
PCB	Polychlorinated Biphenyl
PCE	tetrachloroethene
$\text{pCi/g}$	picocuries per gram
PCOC	Potential Contaminant of Concern
POC	Point of Compliance
POE	Point of Evaluation
ppb	part per billion ( $\mu\text{g/Kg}$ or $\mu\text{g/L}$ )
ppm	part per million ( $\text{mg/Kg}$ or $\text{mg/L}$ )
PPRG	Programmatic Preliminary Remediation Goal
PSZ	Perimeter Security Zone
PU&D	Property Utilization and Disposal
RCRA	Resource Conservation and Recovery Act
RCRA 3004(u)	Appendix 1, Waste Management Units RCRA Part B Permit Application
RFCA	Rocky Flats Cleanup Agreement
RFFO	Rocky Flats Field Office
RFETS	Rocky Flats Environmental Technology Site

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

(continued)

RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RI	Remedial Investigation
RMRS	Rocky Mountain Remediation Services, L L C
RQ	Reportable Quantity
RSALs	Radionuclide Soil Action Levels
SAP	Sampling and Analysis Plan
SEP	Solar Evaporation Pond
SID	South Interceptor Ditch
SITE	Superfund Innovative Technology Evaluation
SNM	Special Nuclear Material
STP	Sewage Treatment Plant
SVOC	Semivolatile Organic Compound
SWD	Soil Water Database
SWMU	Solid Waste Management Unit
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
UBC	Under Building Contamination
VOC	Volatile Organic Compound
yd <sup>3</sup>	cubic yards

# **SECTION 1.0**

## **INTRODUCTION**

## 1.0 INTRODUCTION

### Background

The Rocky Flats Environmental Technology Site (RFETS) began operation in 1951. Since 1951, materials defined as hazardous substances, pollutants, and contaminants by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and materials defined as hazardous waste and hazardous constituents by the Resource Conservation and Recovery Act (RCRA) and/or the Colorado Hazardous Waste Act (CHWA), have been produced, purchased, stored, consumed, disposed, and released at various locations at RFETS. Contaminants remain within some facility tank and pipe systems and filter plenums. Certain contaminants have been detected and remain in groundwater, sediments, surface water and soils at the Site and thus pose potential human health and environmental risks.

RCRA regulations require that all Solid Waste Management Units (SWMUs) be identified. This became applicable to RFETS with the signing of a Compliance Agreement, on July 31, 1986. At that time, the exact definition of a SWMU had not been formalized, therefore, guidance from the State of Colorado and the regional office of the U.S. Environmental Protection Agency (EPA) was used. The State of Colorado and the EPA required the identification of all areas where environmental releases may have occurred including hazardous waste and non-hazardous waste-related releases. Also included were single-release areas and long-term waste management areas where waste storage may (or is known to) have occurred.

SWMUs were initially identified in 1985 by the Los Alamos operations office and presented in the Draft Comprehensive Environmental Assessment and Response Program (CEARP) Phase I Installation Assessment. The study consisted of a record search, an open literature survey, and interviews with RFETS employees. The SWMU terminology is a RCRA designation consisting of inactive waste disposal sites, accidentally contaminated sites, and sites found to pose environmental concern due to past or current waste management practices. Inspections were conducted on each site. The first identification of RFETS SWMUs, consistent with the guidance provided by the State of Colorado and the regional EPA, was presented as an appendix to the November 1986 RCRA Part B Permit Application.

Formal efforts to document the extent of Site contamination were established with the signing of the Interagency Agreement (IAG) in 1991. At that time, SWMUs at RFETS were re-named as Individual Hazardous Substance Sites (IHSSs). IHSS is a term defined under CERCLA and the IAG as "locations associated with a release or threat of release of hazardous substances which may cause harm to human health/or the environment". The term IHSS is used today at RFETS. The IAG grouped IHSSs into 16 larger Operable Units (OUs) by similar contaminant or geographical location and schedules were set for further characterization.

In accordance with the IAG, a Historical Release Report (HRR) was developed. The original intent of the HRR was to capture existing information on historical incidents and plant practices involving hazardous substances at RFETS. Additionally, the IAG prescribed that the HRR reporting process continue quarterly for reporting of new or newly identified releases of hazardous substances to the environment (now identified as Potential Areas of Concern or PACs).

In 1996, the Rocky Flats Cleanup Agreement (RFCA) was signed superseding the IAG. RFCA incorporated the earlier IAG requirements for updating the HRR, however it was agreed that reporting would be required on an annual basis instead of quarterly. The first Annual Update was submitted in September 1996.

The 16 OUs designated in the IAG were consolidated into 10 OUs during the RFCA negotiation process to reduce field and administrative requirements. The consolidation of former Operable Units are presented in Table 1.1 below.

**Table 1.1 RFCA Consolidation of Former Operable Units**

Interagency Agreement Operable Unit Designation	RFCA Operable Unit Designation
Operable Unit 1	Incorporated into Buffer Zone Operable Unit
Operable Unit 2	Incorporated into Buffer Zone Operable Unit
Operable Unit 3	Incorporated into Buffer Zone Operable Unit
Operable Unit 4	Incorporated into Industrial Area Operable Unit
Operable Unit 5	Unchanged Under RFCA
Operable Unit 6	Unchanged Under RFCA
Operable Unit 7	Unchanged Under RFCA
Operable Unit 8	Incorporated into Industrial Area Operable Unit
Operable Unit 9	Incorporated into Industrial Area Operable Unit
Operable Unit 10 <sup>2</sup>	<sup>2</sup> Incorporated into Industrial Area Operable Unit
Operable Unit 11	Incorporated into Industrial Area Operable Unit
Operable Unit 12	Incorporated into Industrial Area Operable Unit
Operable Unit 13	Incorporated into Industrial Area Operable Unit
Operable Unit 14	Incorporated into Industrial Area Operable Unit
Operable Unit 15 <sup>3</sup>	Incorporated into Industrial Area Operable Unit
Operable Unit 16	Incorporated into Industrial Area Operable Unit

Note. Shading Indicates Official Closure of Operable Unit.

Bold Text Indicates Remaining Operable Units with an Action

<sup>1</sup>Groundwater Collection is expected to continue for one year from the collection well located within IHSS 119.1 (Operable Unit 1) pending approval of the CAD/ROD Modification.

<sup>2</sup>IHSSs 170, 174A, 174B and 177 within former Operable Unit 10 are in Buffer Zone Operable Unit.

<sup>3</sup>Several IHSSs deferred until D&D is initiated (refer to Operable Unit 15 CAD/ROD or Appendix 1).

At that time, Corrective Action Decisions/Record of Decisions (CAD/RODs) for OUs 11, 15, and 16 were already complete and OUs 1, 3, 5, 6, and 7 were nearing completion. For this

reason these OUs retained their IAG designations. The Buffer Zone OU incorporates all IHSSs from OU 2, IHSSs 170, 174A, and 174B from the former OU 10, and, all PACs within those IHSSs and the Buffer Zone. The Industrial Area OU incorporates all IHSSs from OUs 4, 8, 9, 12, 13, 14, IHSSs 115 and 196 from OU 6, all IHSSs from OU 10 with the exception of 170, 174A, and 174B, and all PACs and Under Building Contamination sites (UBCs, discussed on following page) located within the Industrial Area.

A large portion of the text contained within this Annual Update pertains to new information gathered to update previous IHSS or PAC descriptions. Many of the PAC narrative updates reflect Regulatory Agency comments to earlier annual updates. During this reporting period from August 1, 1999 through August 1, 2000, no new spills, releases, or findings of contaminants were identified at RFETS and therefore, this annual update does not identify any new CERCLA sites (i.e., IHSSs, PACs, or UBCs). However, this update does describe near-term fieldwork planned for several HRR Sites within the next reporting period. This annual update is prepared in accordance with Part 9, Subpart B, paragraph 119 (l) of RFCA (DOE, 1996) Notification of spills, releases, or findings and is presented in the following format:

For purposes of the HRR process and mapping clarity, original IHSS locations were designated a unique "PAC Area" prefix number based upon geographic location. For example, IHSS 123 1 is designated as PAC 700-123 1. An area where there has been a recent release or finding of a hazardous substance in the environment (post 1992) is also assigned a PAC area prefix number followed by the next numerically highest PAC reference number for that area. These areas are referred to as PACs and are equal to IHSSs in that they are CERCLA sites requiring disposition through the HRR and CERCLA reporting process. PAC prefixes are selected according to 14 geographical subdivisions as illustrated on Figure 1-1. Large PAC areas (i.e., PACs which cross geographic PAC boundaries) such as the Original Process Waste Lines (OPWL, PAC #000-121) and the Central Avenue Ditch (PAC #000-172) have been assigned a 000 prefix due to their boundary extent. To date, there are twelve IHSSs and/or PACs with the 000 prefix.

In addition to the 14 geographic areas, potential Under Building Contamination (UBC) sites were also discussed in the original HRR (DOE, 1992). UBC areas were necessary due to the potential contamination of soil and/or groundwater under specific buildings from broken process waste lines or other potential sources related to the buildings history. Appendix 4, Plate #4, Potential Areas of Concern, illustrates the UBC locations identified at RFETS.

PAC narratives include U.S. Department of Energy (DOE) Rocky Flats Field Office (RFFO) recommendations for further action or no further action (NFA). These recommendations are based on process knowledge, analytical data, conservative risk-based screens, or formally conducted personal interviews.

RFCA defines NFA as the determination that remedial actions are not presently warranted, however, such decisions are subject to re-visitation at the time of the Final CAD/ROD. *The Agency Acceptance Form included in past Quarterly and Annual Updates to the HRR has been discontinued effective this Annual Update. The specific IHSS, PAC and UBC regulatory status will be determined as part of an on-going process between RFETS personnel and regulatory counterparts.*

This annual update is divided into three sections and four appendices. They are described as follows:

**Section 1.0** provides the evolutionary history of the HRR and describes the content of this document.

- **Table 1.1**, located in the introductory background section provides an overview of the Operable Unit re-designation as a result of varying regulatory agreements (i.e., the IAG and RFCA).
- **Table 1.2** is provided as an overview status summary of the IHSS and PAC status contained within this Annual Update to the HRR.
- **Table 1.3** is an up-to-date account of; (1) the number of IHSSs and PACs accepted as proposed NFA either by written concurrence from the regulatory agencies or through the Corrective Action Decision/Record of Decision (CAD/ROD) process, (2) the number of IHSSs and PACs "proposed" for NFA since the 1992 HRR for which concurrence has not been received from the Regulatory Agencies, (3) the number of total CERCLA sites warranting further research, investigation or action, (4) the number of IHSSs, PACs, and UBCs that are believed to be D&D dependent and have been deferred until D&D commences as stated in the ER Baseline.

**Section 2.0** provides revised PAC narratives and incorporates new information regarding previously designated IHSSs and/or PACs. The revised narratives include the following types of information:

- Additional information or findings related to previously designated CERCLA sites such as new data, boundary changes, corrections identified, etc.;
- Proposed NFA status based upon process knowledge, analytical data, conservative risk-based screening, source removal (or approved treatment) of contaminants in accordance with Agency approved Proposed Action Memorandums (PAMs), Interim Measure/Interim Remedial Action (IM/IRA), or other authorizing decision documents,

- Additional information requested by the Regulatory Agencies during the comment and response period to meet the proposed NFA criteria,
- Approved NFA status based upon final CAD/ROD or other authorizing documentation such as letters from the Regulatory Agencies, and
- Accelerated actions taken within the Environmental Restoration (ER) framework of field activities

**Table 1.2 HRR PAC Narrative Updates Contained in this Annual Report**

<b>IHSS</b>	<b>OU</b>	<b>PAC</b>	<b>Site Description/Status</b>	<b>Updated</b>	<b>Proposed NFA</b>
110	BZ	NE-110	Trench T-3 <i>Response to Agency comments Clarified</i>	1996 Annual Update 1997 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update
NA	BZ	NE-1404	Diesel Spill at Pond B-2 Spillway <i>Describes Near-term Actions</i>	3rd Quarterly Update 1998 Annual Update 2000 Annual Update	1998 Annual Update
NA	BZ	NE-1409	Interceptor Trench Pump House (ITPH) <i>Response to Agency comments Clarified</i>	7 <sup>th</sup> Quarterly Update 1999 Annual Update 2000 Annual Update	1999 Annual Update 2000 Annual Update
NA	IA	100-607	Building 111 Transformer <i>Describes Near-term Actions</i>	2000 Annual Update	-
156 1	IA	300-156 1	Building 371 Parking Lot <i>Response to Agency comments Clarified</i>	1997 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update
169	IA	500-169	Waste Drum Peroxide Burial <i>Describes Near-term Actions</i>	1998 Annual Update 2000 Annual Update	-
164 1	IA	600-164 1	Radioactive Slab from Bldg 771 <i>Response to Agency comments Clarified</i>	1997 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update
189	IA	600-189	Nitric Acid Tanks <i>Describes Near-term Actions</i>	1997 Annual Update 2000 Annual Update	-
NA	IA	600-1001(a)	Waste Oil Identified in PAC 600-1001 <i>Assigned new PAC Reference #</i>	1997 Annual Update 2000 Annual Update	1997 Annual Update (Accepted NFA 2000)

<b>IHSS</b>	<b>OU</b>	<b>PAC</b>	<b>Site Description/Status</b>	<b>Updated</b>	<b>Proposed NFA</b>
123 1	IA	700-123 1	Valve Vault 7 <i>Response to Agency comments Clarified</i>	1997 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update
NA	IA	700-1102	Transformer Leak 776-4 <i>Describes Near-term Actions</i>	1996 Annual Update 1997 Annual Update 2000 Annual Update	-
108	BZ	900-108	Trench T-1 <i>Response to Agency comments Clarified</i>	1997 Annual Update 1998 Annual Update 1999 Annual Update 2000 Annual Update	1999 Annual Update 2000 Annual Update
112	BZ	900-112	903 Pad <i>Reporting New Information</i>	1997 Annual Update 1998 Annual Update 1999 Annual Update 2000 Annual Update	-
140	BZ	900-140	Hazardous Disposal Area <i>Describes Status &amp; Future Actions</i>	1997 Annual Update 1998 Annual Update 2000 Annual Update	-
155	BZ	900-155	903 Lip Area <i>Reporting New Information and Redefining IHSS Boundary</i>	1997 Annual Update 1998 Annual Update 1999 Annual Update 2000 Annual Update	
183	BZ	900-183	Gas Detoxification Area <i>Response to Agency comments Clarified</i>	1997 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update
NA	IA	900-1311	Septic Tank East of Bldg 991 <i>Response to Agency comments Clarified</i>	1999 Annual Update 2000 Annual Update	1999 Annual Update 2000 Annual Update
NA	BZ	900-1318	Release of F001 Listed Waste Water to Soil <i>Response to Agency comments Clarified</i>	1997 Annual Update 1998 Annual Update 2000 Annual Update	1997 Annual Update 2000 Annual Update

Note Refer to Appendix 1 for Current Status of all HRR Sites  
Refer to Appendix 2 for Regulatory Agency Correspondence Letters

116

**Section 3.0** briefly describes events that occurred at Rocky Flats during the reporting period which are considered significant and should be documented

**Appendix 1** provides a list of all sites identified in the original HRR, quarterly updates, and annual updates. A cross-reference with IHSS number (if applicable), IHSS numbers for PACs occurring within an IHSS boundary, and OU designation is provided in accordance with RFCA. Additionally, Appendix 1 provides a reference to quarterly or annual reports updating the information provided in the original PAC identification. Recommendation for a PAC as Proposed NFA or Approved NFA is also provided along with the reference to the quarterly or annual report the designation was assigned. New PACs and PAC or IHSS revisions inclusive to this annual report are shaded in Appendix 1.

**Appendix 2** provides specific HRR correspondence letters from the Regulatory Agencies. To date, the Site has received three letters (with attachments) from the Regulatory Agencies providing important information specific to the HRR. The letters pertain to reviews of the 1997, 1998, and 1999 HRR Annual Reports. Resolution of issues and disposition of the subject PACs and IHSSs will be addressed through ongoing discussions with the Agencies. In brief, the letters conditionally document acceptance of proposed NFA status, request additional information or data for some PACs or IHSSs which were proposed NFA or specify non-concurrence with PACs or IHSSs proposed for NFA in the HRR reporting process.

**Appendix 3** is identified as place-keeper to describe and map any locations where potentially RCRA hazardous soil has been placed back into an excavation (with approval from the Agencies) as a result of a non-RFCA generation process such as repair of a waterline. The CDPHE stated on January 12, 1998, that for a "defacto" delisting determination of soils containing listed waste, that  $10^{-6}$  health risk-based numbers for direct contact by a resident could be used. This type of activity occurred once in the 1998 reporting period resulting in PAC 700-1117 (with NFA status). In August 2000, one occurrence of this type of activity may have occurred as a result of an emergency water-line repair in the 700 Area. The excavation area is identified in Appendix 3 (Figure A-3) however, has not been designated a PAC Reference Number or incorporated into an existing IHSS because characterization data has not been received from the laboratory. An Update will be provided to the Regulatory Agencies upon receipt of the analysis.

**Appendix 4** contains a series of four Plates. Each Plate included in this update has been reviewed for accuracy and compared to information compiled and documented during the investigation processes. The RFCA Consolidated Operable Unit map presented in RFCA and the original HRR PAC Area format are combined and illustrated as Plate #1. Plate #1 only illustrates IHSSs for which further investigation or action is warranted (as proposed in the HRR reporting process). NFA and proposed NFA IHSSs and PACs are illustrated on a separate coverage (Plate #2) thereby easily delineating between the IHSSs which require further action and progress made toward site remediation. In addition, due to the complex nature of the OPWL and associated IHSSs, an additional map (Plate #3) illustrates the OPWL system as a stand-alone

area requiring further investigation For this reporting period, Plate #3 has been revised to show areas of known or suspected leaks within the waste transfer system piping, and specific Line Section numbers Plate #3 also identifies what type of material was used for piping, results of pressure tests and if the pipe has been abandoned or in current use The PAC and UBC map (Plate #4) is consistent with past HRR Update Reports and shows PACs/UBC areas which require further action

### Summary

In summary, this report is intended to provide a comprehensive compilation of historical information updated to reflect present conditions and response actions at the RFETS with regard to environmental releases or significant events It is not the intention for this annual update or past updates to change or amend researched information in the original HRR but rather to provide additional facts for specific areas, as they become available Prior to initiating work within any designated area, all available documents should be reviewed including but not limited to Environmental Technical Memorandums, Data Summary Reports, project specific decision documents, and Accelerated Action Completion Reports

For information regarding groundwater contaminant plumes and surface water monitoring at RFETS, refer to the Annual RFCA Groundwater Monitoring Reports and the Interim Measures/Interim Remedial Actions (IM/IRA) for the Industrial Area annual report(s)

**Table 1.3 HRR Site Tracking and Status Through September, 2000<sup>1</sup>**

<b>Proposed NFA Accepted (CAD/ROD Process or other approval)</b>	<b>98</b>
<b>Proposed No Further Actions (Pending Agency Review)</b>	<b>63</b>
<b>Potential Further Action Warranted</b>	<b>174</b>
<b>D&amp;D Deferred/Dependant</b>	<b>22</b>
<b>Total</b>	<b>357</b>

<sup>1</sup> Tracking includes IHSSs, PACs, and UBCs at RFETS

## **SECTION 2.0**

# **REVISED PAC NARRATIVES**

**PAC REFERENCE NUMBER: NE-110**

IHSS Reference Number      110, Buffer Zone Operable Unit

Unit Name                      Trench T-3

Approximate Location      N750,000, E2,087,000

Date(s) of Operation or Occurrence

1964 - 1968

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

Trench T-3 was used primarily for the disposal of sanitary waste-water and sewage treatment plant sludge. The sludge removed from the waste-water treatment plant was placed on sludge drying beds. Dried material removed from the sludge drying beds was placed into Trench 3 (one of the East Disposal Trenches, also referred to as the East Trenches) until August 1968. The sanitary sludge disposal trenches are reported to be approximately 10 feet deep with two feet of soil cover (DOE, 1992). In addition, miscellaneous waste including crushed drums, asphalt planking, and construction debris was also disposed in Trench T-3 (DOE, 1996a).

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination was present in sludge during this time-frame. It is reported that the older sludge had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge in the East Trenches (not specifically T-3) was reported between a maximum of 3,591 pCi/g in June 1960 and a minimum of 382 pCi/g in August 1964. Uranium contamination was present in flattened drums that were disposed in this trench (DOE, 1992). Flattened drums, estimated to be more than 300 in total number are known to have been buried in Trench T-3 (DOE, 1996a).

Responses to Operation or Occurrence

A source removal action was performed in the summer of 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was authorized by a Proposed Action Memorandum (PAM) for the Source Removal at Trenches T-3 and T-4 (IHSSs 110 and 111 1), Revision 2, dated March 28, 1996 (DOE, 1996b). Approximately 1,706 cubic yards of volatile organic compound (VOC) contaminated material was removed from Trench T-3 (PAC NE-110) and treated.

Excavation was completed July 3, 1996 and treatment of Trench T-3 material was completed by July 11, 1996. The completion report for the project details the treatment process, contaminants removed, the condition of the trench following the removal action, and analytical results (DOE, 1996c).

Approximately 200 cubic yards of debris (primarily crushed drums) were removed from the trench, treated, if contaminated with VOCs, and packaged for off-site disposal. During packaging, one to two pounds of a black material was released from a drum and spread over a small work area. The material was found to be radioactive and may have been depleted uranium. Two roll-off containers and two waste-crates were used to contain the soil contaminated with this material (DOE, 1996c). The containers were shipped to an approved offsite disposal facility.

#### Fate of Constituents Released to Environment

Soil treated as part of the source removal action were returned to the trench upon review of the post-treatment analytical data to confirm clean-up action levels were met. Debris excavated from the trench were characterized, treated, size reduced and containerized. Containerized debris was shipped to the Nevada Test Site (NTS) in September 1997. The source removal action for Trench T-3 removed contamination sources in accordance with cleanup values stipulated in the PAM. It is unlikely that groundwater degradation will continue from Trench T-3 as a result of this source removal (DOE, 1996a).

#### Action/No Further Action Recommendation

The post-treatment levels of VOCs in the treated soils returned to Trench T-3 (PAC NE-110) were below the thermal desorption unit performance standards specified in the PAM (DOE, 1996b) as documented in the completion report (DOE 1996c). Additionally, the excavation verification sample results for the contaminants of concern from Trench T-3 were below the cleanup values stipulated in the PAM (DOE, 1996c). These cleanup values were consistent with the RFCA Tier I Subsurface Soil Action Levels (DOE, 1996d). The detectable VOCs observed in the excavation verification samples for Trench T-3 included carbon tetrachloride in one sample at a concentration of 1.8 ppm and tetrachloroethene in three samples with concentrations ranging from 0.74 ppm to 6.3 ppm. Approved clean-up levels for carbon tetrachloride and tetrachloroethene were 11 ppm and 11.5 ppm respectively (DOE, 1996c).

Trench T-3 (PAC NE-110) is proposed for NFA because the source removal and treatment goals specified in the PAM (DOE, 1996b) were achieved and were consistent with the action levels agreed upon in the RFCA (DOE, 1996d). In accordance with the PAM (DOE, 1996b), the source removal would be considered complete if analysis from verification samples were below cleanup levels or upon reaching groundwater or bedrock. Any remaining contamination beyond these criteria would be subject to groundwater remediation.

In 1999, the East Trenches groundwater remediation project was completed to collect and treat a plume of contaminated groundwater from the East Trenches area. That project is described in the Final East Trenches Plume Project Closeout Report (DOE, 2000)

#### Comments

Trenches T-3 through T-11 are referred to as the East Trenches (DOE, 1992)

Trench T-3 (PAC NE-110) had few operational differences from Trenches T-4 through T-11

No documentation was found regarding the exact dates of operation of individual trenches. Interviewees were unaware of operating dates and could provide no additional information (DOE, 1992)

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000)

#### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1996a, *Annual Update for the Historical Release Report, August 1, 1995 through August 1, 1996* RF/ER-96-0046, September

DOE, 1996b, *Proposed Action Memorandum for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111 1, Revision 2*, RF/ER-95-111 UN, March

DOE, 1996c, *Completion Report for the Source Removal at Trenches T-3 and T-4 IHSS 110 and 111 1*, RF/ER-96-0051, Revision 2, September

DOE, 1996d, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2000, *Final East Trenches Plume Project Closeout Report, Fiscal Year 1999*, RF/RMRS-99-443 UN, February, Rocky Flats Environmental Technology Site, Golden, CO

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

**PAC REFERENCE NUMBER: NE-1404**

IHSS Reference Number                      Not Applicable

Unit Name                                      Diesel Spill at Pond B-2 Spillway

Approximate Location                      N750,500, E2,087,000

Date(s) of Operation or Occurrence

October 27, 1992

Description of Operation or Occurrence

A release of approximately 18 gallons of diesel fuel resulted from a leak in the fuel tank of a portable pump used to transfer water from Pond B-2 to Pond A-2. The release occurred in the spillway area of Pond B-2 approximately 15 feet from the shore of the pond (see Figure 2 1) and was reported to the Regulatory Agencies on October 27, 1992 (DOE, 1993).

Physical/Chemical Description of Constituents Released

The constituent released was diesel fuel (DOE, 1993) Cleanup materials from the diesel spill were managed as a Resource Conservation and Recovery Act (RCRA)-regulated waste pending analytical results because the material potentially contained benzene in excess of the Toxicity Characteristic Leaching Procedure (TCLP) limit. Samples collected from the soil affected by the release were analyzed for TCLP volatiles and a gross alpha/beta screen. Analytical results (attached) for TCLP analysis show that the soil affected by the release was not RCRA hazardous and that VOCs were below detection limits (DOE, 1993).

Responses to Operation or Occurrence

A containment dike was built around the pump to prevent residual fuel from entering the pond. Absorbent booms were pulled across Pond B-2 from west to east to absorb the fuel released. Absorbent pillows were also used. Additional booms and absorbent pads were placed on the pond until a second sweep could be completed. The pump was taken out of service for repair. An estimated 200 pounds of material (soil and absorbent booms) were recovered from the spill area, containerized, and managed in a RCRA 90-day accumulation area pending analytical data. The analytical data was received on October 29, 1992 (DOE, 1993). Approximately 1 ½ yds<sup>3</sup> of fuel-contaminated soil was removed from the spill site and containerized in half-crate plywood boxes (EG&G, 1992).

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00502

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 92X0

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: B-2 SOIL

Sample wt/vol: 5. (g/mL) ML

Lab File ID: OCT2902

Level: (low/med) LOW

Date Received: 10/29/92

% Moisture: not dec.100.

Date Analyzed: 10/29/92

Column: (pack/cap) CAP

Dilution Factor: 10.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	100.	U
74-83-9-----	Bromomethane	100.	U
75-01-4-----	Vinyl Chloride	100.	U
75-00-3-----	Chloroethane	100.	U
75-09-2-----	Methylene Chloride	50.	U
67-64-1-----	Acetone	100.	U
75-15-0-----	Carbon Disulfide	50.	U
75-35-4-----	1,1-Dichloroethene	50.	U
75-34-3-----	1,1-Dichloroethane	50.	U
540-59-0-----	1,2-Dichloroethene (total)	50.	U
67-66-3-----	Chloroform	50.	U
107-06-2-----	1,2-Dichloroethane	50.	U
78-93-3-----	2-Butanone	100.	U
71-55-6-----	1,1,1-Trichloroethane	50.	U
56-23-5-----	Carbon Tetrachloride	50.	U
75-27-4-----	Bromodichloromethane	50.	U
78-87-5-----	1,2-Dichloropropane	50.	U
10061-01-5-----	cis-1,3-Dichloropropene	50.	U
79-01-6-----	Trichloroethene	50.	U
124-48-1-----	Dibromochloromethane	50.	U
79-00-5-----	1,1,2-Trichloroethane	50.	U
71-43-2-----	Benzene	50.	U
10061-02-6-----	trans-1,3-Dichloropropene	50.	U
75-25-2-----	Bromoform	50.	U
108-10-1-----	4-Methyl-2-Pentanone	50.	U
591-78-6-----	2-Hexanone	50.	U
127-18-4-----	Tetrachloroethene	50.	U
79-34-5-----	1,1,2,2-Tetrachloroethane	50.	U
108-88-3-----	Toluene	31.	J
108-90-7-----	Chlorobenzene	50.	U
100-41-4-----	Ethylbenzene	21.	J
100-42-5-----	Styrene	50.	U
1330-20-7-----	Xylenes (total)	120.	

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00504

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 92X0

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: B-2 SOCK

Sample wt/vol: 5. (g/mL) ML

Lab File ID: OCT2904

Level: (low/med) LOW

Date Received: 10/29/92

% Moisture: not dec.100.

Date Analyzed: 10/29/92

Column: (pack/cap) CAP

Dilution Factor: 10.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	100.	U
74-83-9	-----Bromomethane	100.	U
75-01-4	-----Vinyl Chloride	100.	U
75-00-3	-----Chloroethane	100.	U
75-09-2	-----Methylene Chloride	50.	U
67-64-1	-----Acetone	100.	U
75-15-0	-----Carbon Disulfide	50.	U
75-35-4	-----1,1-Dichloroethene	50.	U
75-34-3	-----1,1-Dichloroethane	50.	U
540-59-0	-----1,2-Dichloroethene (total)	50.	U
67-66-3	-----Chloroform	50.	U
107-06-2	-----1,2-Dichloroethane	50.	U
78-93-3	-----2-Butanone	100.	U
71-55-6	-----1,1,1-Trichloroethane	50.	U
56-23-5	-----Carbon Tetrachloride	50.	U
75-27-4	-----Bromodichloromethane	50.	U
78-87-5	-----1,2-Dichloropropane	50.	U
10061-01-5	-----cis-1,3-Dichloropropene	50.	U
79-01-6	-----Trichloroethene	50.	U
124-48-1	-----Dibromochloromethane	50.	U
79-00-5	-----1,1,2-Trichloroethane	50.	U
71-43-2	-----Benzene	50.	U
10061-02-6	-----trans-1,3-Dichloropropene	50.	U
75-25-2	-----Bromoform	50.	U
108-10-1	-----4-Methyl-2-Pentanone	50.	U
591-78-6	-----2-Hexanone	50.	U
127-18-4	-----Tetrachloroethene	50.	U
79-34-5	-----1,1,2,2-Tetrachloroethane	50.	U
108-88-3	-----Toluene	50.	U
108-90-7	-----Chlorobenzene	50.	U
100-41-4	-----Ethylbenzene	50.	U
100-42-5	-----Styrene	50.	U
1330-20-7	-----Xylenes (total)	50.	U

### Fate of Constituents Released to Environment

The spill area was cleaned up until no visual evidence or odor of contamination was present. The pond area was monitored by visual examination for the presence of an oil sheen for one week after the spill. During this period, no additional contamination was detected. Soil removed from the spill area was analyzed for TCLP volatile organic compounds, and VOCs were not detected above detection limits (EG&G, 1992).

### Action/No Further Action Recommendation

Based upon the nature of the release and response to the occurrence, a residual source of contamination associated with PAC NW-1404 is not likely. The spill and spill area were cleaned up and, as a result, a contaminant source for PAC NW-1404 is not suspected.

In response to comments received from the Regulatory Agencies on July 9, 1999 (and discussed in a meeting held May 18, 2000) additional sampling will be conducted at four locations for Benzene, Toluene, Ethyl-benzene, and Xylene (BTEX) and Total Petroleum Hydrocarbons (TPH) to confirm that a residual source of diesel fuel does not exist at PAC NE-1404. The sampling event will be conducted in accordance with the Buffer Zone (BZ) Sampling and Analysis Plan and will likely occur in early 2001.

### Comments

PAC NE-1404 does not overlap with IHSS 142 6 (Pond B-2) as initially reported in the 1998 Annual Update to the HRR (DOE, 1997).

IHSS NE-142 6 consists of the Pond B-2 sediment and is not being proposed as NFA.

There was no release to downstream RFETS waters due to the isolation of Pond B-2 water from the normal B-Series drainage.

### References

DOE, 1993, *Quarterly Update from January 1, 1993 to April 1, 1993 Historical Release Report*, 93-RF-5296, Rocky Flats Environmental Technology Site, Golden, CO, April.

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July.

DOE, 1997, *Annual Update for the Historical Release Report*, RF/RMRS-97-073.UN, Rocky Flats Environmental Technology Site, Golden, CO, September.

EG&G, 1992, Critique Meeting Minutes, October 28, 1992.

**PAC REFERENCE NUMBER: NE-1409**

IHSS Number                      Not Applicable  
Unit Name                        Interceptor Trench Pump House  
Approximate Location        N751,647, E2,085,277

Date(s) of Operation or Occurrence

A release of contaminated water from primary to secondary containment occurred on July 20, 1993, sometime after a 10 30 a m inspection and before 1 00 p m when Building 910 operators responded to an alarm at the Interceptor Trench Pump House (ITPH), (DOE, 1994)

Description of Operation or Occurrence

An occurrence related to the pumping operation of surface and ground water collected by the Solar Evaporation Ponds Interceptor Trench System (ITS) and subsequent transfer to the Modular Storage Tanks (MSTs) occurred on July 20, 1993. Approximately 4,700 gallons of RCRA F-listed water in the primary containment piping that connected the MSTs to the ITS sump began leaking into the secondary containment. The water overflowed back into the ITPH as designed and was fully contained in the pump house secondary containment. When the water level in the pump house secondary containment rose, the local alarm activated and the pumps automatically shut down. This alerted the Building 910 operators to the occurrence. When the building operators found that liquid was still siphoning out through the pump, they closed the manual valves (DOE, 1994).

Some of the water drained back into the ITS sump through a failed hose connection on the secondary containment piping located within the ITS sump. This water was pumped back into the MSTs (DOE, 1994).

Physical/Chemical Description of Constituents Released

The released material was considered RCRA F-listed hazardous waste based on 6 CCR 1007-3 because it passed through the ITS sump (which is considered a waste generation point). Applicable EPA waste codes for the released material include F001, F002, F003, F005, F006, F007 and F009. Table 2.1 provides a summary of the RCRA constituents historically present in the ITS water and an estimate of the amount potentially released based on the volume released (DOE, 1994). Samples were taken in 1991-1992 at the ITPH sump (SW095). Based on the data presented in Table 2.1, some of the constituents appear to have exceeded current RFCA surface water action levels and standards (RFCA Attachment 5, March 21, 2000) at the point of release. Note that RFCA was not in effect at the time of release and that the point of release at the ITPH sump was not to surface.

water (i.e. North Walnut Creek) or the environment but rather to the secondary containment within the sump

**Table 2.1 1991-1992 Historical Summary Statistics for ITPH Water (Station SW095)**

Potential Constituent Of Concern	Number of Samples	Number of Detects	Mean (mg/L)	Regulatory Limit (mg/L)	Estimated Amount Released (lb)
<b>Total Metals<sup>1</sup></b>					
Cadmium	24	0	00184 <sup>3</sup>	1 0 <sup>2</sup>	0 000074
Chromium	26	8	00984	5 0 <sup>2</sup>	0 000394
Lead	28	2	00123	5 0 <sup>2</sup>	0 000049
Silver	22	2	00393	5 0 <sup>2</sup>	0 000157
<b>Volatile Organic Compounds</b>					
Methylene Chloride	25	0	00230 <sup>3</sup>	0 44 <sup>4</sup>	0 000092
Carbon Tetrachloride	25	1	00258	0 057 <sup>4</sup>	0 000103
Chloroform	25	0	00192 <sup>3</sup>	0 046 <sup>4</sup>	0 000076
Tetrachloroethene	25	0	00250 <sup>3</sup>	0 056 <sup>4</sup>	0 000100
Toluene	25	0	00250 <sup>3</sup>	0 080 <sup>4</sup>	0 000100
Trichloroethene	25	2	00302	0 054 <sup>4</sup>	0 000121
<b>Plating Substances</b>					
Cyanide	25	1	01000	1 2-1,9 <sup>4</sup>	0 000400
Nickel	25	2	01042	0 040 <sup>4</sup>	0 000417

<sup>1</sup>Concentration of metals below characteristic regulatory limit therefore, water is not regulated characteristic waste

<sup>2</sup>TCLP maximum concentration of contaminants for toxicity characteristic

<sup>3</sup>Mean calculated using half the detection limit for concentrations at the detection limit.

<sup>4</sup>Land Disposal Restricted Constituent Concentration treatment standard levels in wastewater (reference §268 43)

### Responses to Operation or Occurrence

The water that overflowed into the MST pump house was pumped into a portable tanker and trucked to Building 374 for treatment

The following actions were performed to operate the system in accordance with RCRA requirements as summarized in the spill notification report (DOE, 1994):

- 1 Repaired the primary transfer pipeline,
- 2 Modified the secondary containment portion of the line within the ITS sump to prevent leakage of water back into the sump Although the portion of the line can be visually inspected, it was preferable to modify the secondary containment in this manner;
- 3 Re-tested the line following repair,
- 4 Completed or repaired leak-detectors in the secondary containment portion of the line that were not operational at the time of the incident,

- 5 Confirmed that the process control logic supported positive shut-down of the pumps when a leak is detected in the secondary containment system of the transfer lines from the ITPH to the MSTs,
- 6 Repaired the remote alarm which was not operable when the liquid was released into the pump house,
- 7 Analyzed pressure conditions in the Building 910 feed system to determine if components had experienced an over-pressurization, and
- 8 Incorporated pressure-surge control to ensure "hammer-free" operation when the liquid discharge is intermittently secured by automatically operating feed valves in Building 910

#### Fate of Constituents Released to Environment

No release to the environment is known to have occurred from this incident, however, because the concrete sump that received the waste is unlined, the RCRA Contingency Plan was implemented as a precautionary measure (DOE, 1994) PAC NE-1409 had not been subject to immediate investigation until construction activities related to the MST Freeze Protection project were initiated in November 1998. Four soil samples were collected in December 1998 and January 1999 in support of the Site Survey Determination for Environmental and Worker Exposure, the supporting Soil Disturbance Evaluation and hazardous waste determination requirements. The sample locations (Figure 2.2) were placed at each corner of the ITS sump and selected based on professional judgement (i.e., if a release actually had occurred from the sump the soil surrounding the sump would likely be contaminated). Based on the characteristics of the waste that accumulated in the sump, the soil samples were analyzed for metals and VOCs. Analysis for cyanide was not performed because the waste concentrations (Table 2.2) are below background concentrations. Additionally, because groundwater in the surrounding area is contaminated with nitrate and uranium, samples were also analyzed for nitrate and isotopic radionuclides. Sampling for semivolatile organic compounds (SVOCs) was requested by the qualified hazardous waste generator and performed at two of the four locations.

**Table 2.2 Summary of Results for PAC NE-1409**

Potential Contaminants of Concern <sup>1</sup>	Number of Surface Soil Samples	Number of Detects > RFCA Tier II <sup>2</sup>	Comparison Values (mg/Kg or pCi/g) Open Space		Range of Values Detected (mg/Kg or pCi/g)	
			RFCA Tier II <sup>3,4</sup>	RFCA Tier I <sup>5,6</sup>		
Volatile Organic Compounds					Minimum	Maximum
Acetone	4	0	1.92E+05	1.92E+05	0.019	0.028
Methylene Chloride	4	0	5.98E+02	2.39E+05	0.008	0.011
Total Metals						
Molybdenum	4	0	9.61E+03	9.61E+03	0.26	0.46
Thallium	4	0 <sup>7</sup>	-- <sup>7</sup>	-- <sup>7</sup>	0.67 <sup>7</sup>	1.2 <sup>7</sup>
Radionuclides						
Plutonium-239/241	4	0	252	1429	0.092	0.142
Uranium-235	4	0	24	135	Not detected	0.081
Nitrate						
Nitrate	4	0	>1E+06	>1E+06	2.1	31.8

1 Contaminants of concern are those chemicals detected above background concentrations presented in the Geochemical Characterization of Background Surface Soils Background Soils Characterization Program (DOE, 1995)

2 PAC NE-1409 is within the Buffer Zone OU, Open Space RFCA Action Levels Apply

3 Tier II values for non-radionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

4 Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident.

5 Tier I values for non-radionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

6 Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

7 RFCA action levels do not exist for thallium because of a lack of toxicity information. The value is in excess of RFETS background concentrations but within the background range 0.8 to 1.2 mg/Kg

### Action/No Further Action Recommendation

Results of the analyses are summarized in Table 2.2 along with the appropriate RFCA action level. All of the analytical results were below RFCA action levels.

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. The incident occurred in 1993 and was not a continuing release. Potential Contaminants of Concern (PCOCs) for PAC NE-1409 were not detected and therefore PAC NE-1409 is proposed for NFA consistent with criteria set forth in the RFCA (DOE, 1996).

### Comments

All of the analytical results are presented in the Draft No Further Action Justification Document for Incorporation into the HRR for PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313 (RMRS, 1999).

In response to comments received from the Regulatory Agencies on June 23, 2000, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000). The Interim Update included detailed attachments consisting of CPIR Report No. 93-007 (with amendments), critique meeting notes, analytical data, and maps (36 pages total). The 36-page attachment is not provided in this Annual Update to the HRR, but is available in the Administrative Record.

## References

DOE, 1994, *Historical Release Report, Seventh Quarterly Update, January 1, 1994 to March 31, 1994*, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

RMRS, 1999, *Draft No Further Action Justification Document for Incorporation into the Historical Release Report (HRR) PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313*, Rocky Flats Environmental Technology Site, Golden, CO, July

**PAC REFERENCE NUMBER: 100-607**

IHSS Number            Not Applicable

Unit Name              Building 111 Transformer PCB Leak

Location                N749,500, E2,081,500 (inside Building 111)

Date(s) of Operation or Occurrence

In Service Date - September 22, 1954  
February 1984 (first documentation) through early-mid 1986 (transformer repaired)

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

A large electrical transformer is located inside the Building 111 basement. The transformer holds approximately 500 gallons of dielectric cooling oil which at one time, contained PCBs (DOE, 1992). In February 1984, the transformer (111-1) was first documented to be leaking into the secondary containment which at that time was filled with gravel (DOE, 1992).

On January 30, 1986 the EPA conducted a survey of the Rocky Flats Plant to determine compliance with Federal PCB regulations. The inspection identified a number of leaking transformers, including the Building 111-1 transformer (DOE, 1992). Follow-up inspection by plant personnel indicated that leaks originated at the transformer's tap changer and oil sample valve.

Physical/Chemical Description of Constituents Released

An unknown amount of PCB-bearing cooling oil leaked from the transformer between February 1984 (possibly earlier) and early to mid-1986. It is not known whether the leaks during this period were continuous or intermittent. Samples of the oil collected in early 1984 showed 17 ppm (Aroclor 1260), a commercial PCB formulation, in a paraffin-based mineral oil. Service records maintained by the RFETS Plant Power organization indicate that samples were collected of the oil on July 12, 1985, with 251 ppm PCBs, and January 7, 1987 with 7.3 ppm PCBs.

Responses to Operation or Occurrence

Samples collected in early 1984 indicated that PCB levels in the cooling oil were below the EPA regulatory limit of 50 ppm and therefore, no corrective actions were taken at that time (DOE, 1992). Available documents suggest that the Building 111-1 transformer was cleaned and repaired in August 1986. Service records document that retrofilling of the dielectric oil occurred on September 20, 1986. Residual staining on the transformer concrete pad was noted in January 1987, and it was

suggested that the pad be coated with a sealant. However, at present time, there is no indication of a sealant being applied. The gravel lining in the secondary containment is believed to have been removed in 1988.

During a 1991 plant-wide investigation of PCB contamination resulting from transformers and other potential areas where PCBs were handled or stored, the Industrial Hygiene organization collected 14 smear samples from Building 111-1 transformer. An EPA approved method (EPA Method 8080) was used and the samples analyzed by an off-site laboratory. PCB contamination was not identified on the exterior of the transformer or surrounding area.

#### Fate of Constituents Released to Environment

No documentation has been identified which details the fate of constituents potentially released to the environment.

#### Action/No Further Action Recommendation

Building 111 is currently scheduled for Decontamination and Decommissioning (D&D) in Fiscal Year 2001. Sampling will be conducted at PAC 100-607 in accordance with a standard Reconnaissance Level Characterization Plan (RLCP) contained in the Decontamination and Decommissioning Characterization Protocol (DDCP, MAN-077-DDCP). A detailed sampling package for the Building 111 Cluster will be completed and submitted to the Administrative Record (AR). D&D sampling at this location will be consistent with prior environmental Sampling and Analysis Plans (SAPs) for sampling suspect transformer pads. If it is found that PCB contamination does not exist, this PAC will be recommended for NFA through an Interim Update to the HRR and require acceptance by the Regulatory Agencies prior to the submittal of the 2001 HRR Annual Update to support the immediate D&D schedule.

#### Comments

The RLCP process enables characterization of potentially contaminated building materials for final waste disposition. The Data Quality Objective (DQO) process for D&D activities is consistent with the DQO process used for sampling and characterization of environmental media.

#### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls, RF/ER-95-0066 UN*, Rocky Flats Environmental Technology Site, Golden CO, July

KH, 2000, *Draft Reconnaissance Level Characterization Packages (RLCP) for the Building 111 Cluster*, Rocky Flats Environmental Technology Site, Golden CO, June

**PAC REFERENCE NUMBER: 300-156.1**

IHSS Reference Number 156 1, Industrial Area Operable Unit

Unit Name Building 371 Parking Lot

Approximate Location N750,000, E2,082,500

Date(s) of Operation or Occurrence

1969(?) - February 1973

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

In February 1973, concern was raised because a contaminated soil pile north of Building 334 was located in the construction area for Building 371 (DOE, 1992) Inspection of aerial photographs show evidence of soil being placed in this area as early as 1969 In February 1973, the soil was moved to an area east of the cargo container field (IHSS 165)

Physical/Chemical Description of Constituents Released

Some of the soil stored behind Building 334 may have originated from construction of an addition to Building 774 and from the removal of underground holding tanks in an area adjacent to Building 774 Soil samples and radiological surveys were taken before the pile was removed from the area (now referred to as the Building 371 Parking Lot, DOE, 1992) Results ranged from 3 to 704 disintegrations per minute per gram Approximately 250 cubic yards of soil was removed from the area (DOE, 1992) An interview with a former employee on December 6, 1991 revealed that some of the soil may have originated from Building 707 (DOE, 1992) Interviewees for the CEARP Phase 1 document indicated that the soil pile was located at what is now the Building 334 parking lot No documentation could be found to substantiate this It is assumed that this is the same soil pile because the origins seem to correlate Historical aerial photographs show signs of a soil pile South of Building 371.

Responses to Operation or Occurrence

The soil pile was removed from the 300 Area and placed in the East end of the cargo container field which is IHSS 165 (PAC 900-165) See PAC 900-165 for additional information regarding the new location A former employee recalled that some of the soil may have been transported to north and west of Building 559 until the area was eventually leveled out (DOE, 1992) This augments CEARP Interview Notes which state that the soil was spread out over the hillside southeast of where Building 374 is located

### Fate of Constituents Released to Environment

As part of the Operable Unit 14, Phase I, RFI/RI (DOE, 1995), IHSS 156 1 (PAC 300-156 1), which is broken into two separate locations, was sampled extensively in 1995 (see Figure 2.3). Table 2.3 presents the isotopic radiological analysis showing all analysis below current RFCA Tier II action levels and at or below established background levels.

### Action/No Further Action Recommendation

During the 1995 investigation for IHSS 156 1, all analytical data were collected in accordance with an approved workplan/SAP and were below the established Programmatic Preliminary Remediation Goals (PPRGs). Currently, under RFCA (DOE, 1996), all analysis are below Tier II action levels and further, at or below established background levels for radionuclides. Sampling for IHSS 156 1 was consistent with current sampling and analysis methodologies as agreed upon in a meeting held May 18, 2000 with the Regulatory Agencies and no source could be identified. Therefore, IHSS 156 1 is proposed for No Further Action based upon comparison of the analytical data to current RFCA action levels.

### Comments

This IHSS was investigated in accordance with the IAG schedule for Operable Unit 14.

Information developed on this unit for the HRR study indicates that the IHSS location presented in the IAG may be inaccurate. Additional information indicates that the contaminated soil was likely located South of Building 371 where the 371 parking lot is currently located. The discrepancy in location however, led to both areas being sampled (see Figure 2.3) during the Operable Unit 14 investigation.

No documentation could be found which detailed the fate of constituents potentially released to the environment at this location.

Analytical data from the Operable Unit 14, Phase I, RFI/RI was provided to the Regulatory Agencies in 1999 and is located in the Administrative Record.

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000).

Table 2.3 IHSS 156.1 Surface Soil Analytical Results -- RFCA Soil Action Level Comparison

Unit	Back ground	Tier II	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194
Americium-241	022	38	0.001	0.001	-0.002	0.002	0.006	0.004	0.004
Plutonium-239/240	066	252	0.003	0.004	0.016	0.007	0	0	0.006
Uranium-233, -234	2.25	307	0.5	0.84	0.72	0.8	0.62	0.45	0.79
Uranium-235	094	24	0.082	0.12	0.084	0.047	0.051	0	0.075
Uranium-238	2.0	103	0.54	0.74	0.8	1.1	0.54	0.67	0.74
Tier II SOR	NA		0.01	0.01	0.01	0.02	0.01	0.01	0.01

Unit	Back ground	Tier II	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194
Americium-241	022	38	0.004	0.001	0.006	0.007	0.002	0	0.011
Plutonium-239/240	066	252	0	0.002	0.026	0.01	0.014	0.002	0.031
Uranium-233, -234	2.25	307	0.55	0.84	0.87	0.92	0.65	0.91	0.58
Uranium-235	094	24	0.054	0.065	0.037	0.06	0.042	0.033	0.054
Uranium-238	2.0	103	0.47	1.1	0.86	0.73	0.63	0.93	0.76
Tier II SOR	NA		0.01	0.02	0.01	0.01	0.01	0.01	0.01

Unit	Back ground	Tier II	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194
Americium-241	022	38	0.003	0.005	0.002	0.003	0.008	0.005	0.003
Plutonium-239/240	066	252	0	0.011	0.016	0.018	0.011	0.016	0.004
Uranium-233, -234	2.25	307	1.1	0.77	0.82	0.75	0.83	0.85	0.81
Uranium-235	094	24	0.072	0.019	0.039	0.04	0	0.056	0.051
Uranium-238	2.0	103	1	0.9	0.91	0.78	0.66	0.99	0.71
Tier II SOR	NA		0.02	0.01	0.01	0.01	0.01	0.01	0.01

Unit	Back ground	Tier II	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194	SS436194
Americium-241	022	38	0.02	0.006	0.02	0.025	0.021	0.021	0.003
Plutonium-239/240	066	252	0.1	0.033	0.069	0.06	0.086	0.04	0.004
Uranium-233, -234	2.25	307	0.67	1.4	0.76	0.84	0.85	0.77	0.86
Uranium-235	094	24	0.051	0.026	0.026	0.036	0.063	0.049	0.027
Uranium-238	2.0	103	0.71	1.3	0.7	0.66	0.76	0.69	0.91
Tier II SOR	NA		0.01	0.02	0.01	0.01	0.01	0.01	0.01

Table 2.3 IHSS 156.1 Surface Soil Analytical Results – RFCA Soil Action Level Comparison (Cont.)

Units	Back ground	Tier II AL	SS438594	SS438694	SS438794	SS438894	SS438994	SS439094	SS439194
Americium-241	022	38	0.01	0.003	0.003	0.002	0.002	0.006	0.007
Plutonium-239/240	066	252	0.035	0.015	0.011	0.12	0.009	0.015	0.022
Uranium-233, -234	2.25	307	0.7	0.6	0.86	0.7	0.98	0.73	0.62
Uranium-235	094	24	0.069	0.033	0.025	0.044	0.063	0.056	0.029
Uranium-238	2.0	103	0.46	0.67	0.61	0.78	1	0.82	0.74
Tier II SOR	NA		0.01	0.01	0.01	0.01	0.02	0.01	0.01

Units	Back ground	Tier II AL	SS439094	SS439194	SS439294	SS439394	SS439494	SS439594	SS439694
Americium-241	022	38	0.004	0.007	0.004	0.007	0.01	0.019	0.035
Plutonium-239/240	066	252	0.008	0.011	0.023	0.01	0.04	0.12	0.14
Uranium-233, -234	2.25	307	0.47	0.96	1	0.78	0.81	0.66	0.62
Uranium-235	094	24	0.019	0.014	0.098	0.029	0.067	0.027	0.052
Uranium-238	2.0	103	0.47	1.2	0.96	0.71	0.65	0.82	0.85
Tier II SOR	NA		0.01	0.02	0.02	0.01	0.01	0.01	0.01

AL RFCA Soil Action Level  
 SOR Sum of Ratios  
 Note All results were validated as "V" No problems with data were observed at the indicated level (validated), with one exception, Plutonium activity at Location 433294 was validated as "A", acceptable with qualification  
 Source Data Summary Report 1, Operable Unit No 14, Radioactive Sites

## References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Phase I RFI/RI Work Plan/Data Summary for Operable Unit 14, Radioactive Sites, Vol 1, Draft*, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

**PAC REFERENCE NUMBER: 500-169**

IHSS Reference Number 169, Industrial Area Operable Unit

Unit Name Waste Drum Peroxide Burial

Approximate Location N749,500, E2,083,000

Date(s) of Operation or Occurrence

April 1981

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

During the week ending April 24, 1981, warehouse personnel were transporting three 55-gallon drums of hydrogen peroxide when two of the drums fell off a pallet. According to one reference, one of the drums burst open and the peroxide drained into a culvert at the corner of Fifth and Central Avenues. A second reference states that in April 1981, a 55-gallon drum of 35% hydrogen peroxide solution spilled at the warehouse (no associated building number is given). The content of the drum leaked out and was flushed into a hole with water. According to the RCRA 3004(u) Report, a 55-gallon drum of hydrogen peroxide was buried in the chemical storage area east of Building 551 (DOE, 1992).

Physical/Chemical Description of Constituents Released

A solution of 35% hydrogen peroxide ( $H_2O_2$ ) was released to the environment (DOE, 1992).

Responses to Operation or Occurrence

A hole was excavated east of Fifth Avenue, in the Central Avenue Ditch. The Fire Department then hosed down the area allowing the diluted peroxide to drain into the hole. The hole was refilled with soil on April 23, 1981 (DOE, 1992).

Consistent with findings presented in DOE (1992) and the Phase I RFI/RI Work Plan, OU 13 (EG&G, 1992), Technical Memorandum, and Data Summary, IHSS 169 was proposed for NFA in the 1998 Annual Update to the HRR. Based upon comments received from the Regulatory Agencies on July 19, 1999, Ground Penetrating Radar (GPR) techniques were utilized on June 29, 2000 to determine if a buried drum exists in the area. An area approximately 60 ft by 40 ft was surveyed using GPR at 2-foot grid spacings. Figure 2.4 identifies the location of four anomalies which appear on GPR strip charts as dense shallow objects.

All of the locations identified with the exception of location B are believed to be remnant concrete pieces associated with the fence (now removed) at this location or rocks. Based upon the density readings, location B is considered to be a large dense metallic object (KH, 2000)

#### Fate of Constituents Released to Environment

As presented in DOE (1992), the incident described is believed to be the same as the incident discussed as IHSS 191 (PAC 400-191). As discussed in the HRR, the documentation indicating a 55-gallon drum of hydrogen peroxide was buried in the chemical storage yard was considered suspect and additional documentation was not found which corroborated this report (DOE, 1992). Research during the preparation of the Phase I RFI/RI Work Plan for OU 13 (EG&G, 1992) did not reveal any additional information to substantiate the burial described as IHSS 169. In addition, it was concluded in the Work Plan and the Technical Memorandum 1, Addendum to the Field Sampling Plan, OU 13 (DOE, 1994) that regardless of the location, a release or potential release of hydrogen peroxide does not constitute a threat to human health of the environment (DOE, 1995).

#### Action/No Further Action Recommendation

Based upon the information gathered during the GPR survey, further investigation of this area will continue to determine the identity of the metallic object in accordance with the Industrial Area Characterization schedules for IHSS 500-117 2.

#### Comments

IHSS 500-169 overlaps with IHSS 500-117 2

#### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO,

DOE, 1994, *Technical Memorandum 1, Addendum to the Field Sampling Plan, OU 13*, Rocky Flats Environmental Technology Site, Golden, CO,

DOE, 1995, *Draft Operable Unit 13 Data Summary No 2 100 Area*, RFP/ERM-95-009, Revision 0, Rocky Flats Environmental Technology Site, Golden, CO,

DOE, 1997, *Annual Update of the Historical Release Report*, RF/RMRS-97-073 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO, September

EG&G, 1992, *Phase I RFI/RI Work Plan for OU 13, 100 Area*, 21100-WP-OU13 01, Revision 0, Rocky Flats Environmental Technology Site, Golden, CO, October

KH, 2000, *Building 551 Ground Penetrating Radar Report Conducted June 29, 2000*

**PAC REFERENCE NUMBER: 600-164.1**

IHSS Reference Number 164 1, Industrial Area Operable Unit

Unit Name Radioactive Slab from Building 771

Approximate Location N748,500, E2,083,500

Date(s) of Operation or Occurrence

September 1957

Description of Operation or Occurrence

(Original HRR, DOE, 1992)

After the 1957 fire in Building 771, a radioactively contaminated slab from the east wall of the building was placed in an area northwest of Building 881 for temporary storage. The origin of the slab was originally documented in the HRR (DOE, 1992) as coming from Building 776 which is now believed to be in error because of the discrepancy in timeframes for the 1957 fire. The area impacted is now covered by the southeast corner of the Building 881 Parking Lot (DOE, 1992).

Physical/Chemical Description of Constituents Released

Several hundred square feet of ground surface were affected. No documentation was found which detailed the constituents released to the environment. However, the concrete slab originated from a plutonium manufacturing facility and therefore, it is possible that plutonium had contaminated the slab (DOE, 1992).

Responses to Operation or Occurrence

The slab was reportedly broken up, removed, and the area was cleaned (DOE, 1992).

Fate of Constituents Released to Environment

No documentation was found which detailed the fate of the constituents released to the environment. This IHSS was investigated for Operable Unit 14. As part of the Operable Unit 14, Phase I, RFI/RI (DOE, 1995), fifteen surficial soil samples were collected (Figure 2.5) and analyzed for radionuclides within IHSS 164.1. The isotopic analysis presented in Table 2.4 shows that soil activities for this area are consistent with background activities and that potentially contaminated concrete was effectively cleaned up.

Table 2.4 IHSS 164.1 Surface Soil Analytical Results – RFCA Soil Action Level Comparison

Radionuclide	Units	Background	Tier I AL	SS454694	SS454794	SS454894	SS454994	SS455094	SS455194	SS455194
Americium-241	pCi/g	022	38	0.006	0.003	-0.002	-0.005	0.003	0.003	0.008
Plutonium-239/240	pCi/g	066	252	0.012	0.028	0.037	-0.001	0.027	0.016	0.02
Uranium-233, -234	pCi/g	2.25	307	0.67	0.9	0.82	0.54	1.2	0.8	0.58
Uranium-235	pCi/g	094	24	0.045	0.032	0.023	0.03	0.085	0.056	0.077
Uranium-238	pCi/g	2.0	103	0.68	0.68	0.99	0.67	1.1	0.65	0.7
Tier II SOR	NA			0.01	0.01	0.01	0.01	0.02	0.01	0.01

Radionuclide	Units	Background	Tier I AL	SS455294	SS455394	SS455494	SS455594	SS455694	SS455794	SS455894
Americium-241	pCi/g	022	38	0.016	0.004	0.012	0.002	0.001	0.007	0.003
Plutonium-239/240	pCi/g	066	252	0.076	0	0.005	0.011	0.002	0	0.035
Uranium-233, -234	pCi/g	2.25	307	0.67	1	0.92	0.67	0.76	1.1	0.55
Uranium-235	pCi/g	094	24	0	0.046	0.082	0.04	0.048	0.051	0.042
Uranium-238	pCi/g	2.0	103	0.65	0.88	0.94	0.59	0.91	1	0.51
Tier II SOR	NA			0.01	0.01	0.02	0.01	0.01	0.02	0.01

Radionuclide	Units	Background	Tier I AL	SS455894
Americium-241	pCi/g	022	38	0.008
Plutonium-239/240	pCi/g	066	252	0.028
Uranium-233, -234	pCi/g	2.25	307	0.62
Uranium-235	pCi/g	094	24	0.023
Uranium-238	pCi/g	2.0	103	0.72
Tier II SOR	NA			0.01

AL RFCA Soil Action Level  
SOR Sum of Ratios  
Note All results were validated as "V" No problems with data were observed at the indicated level (validated)  
Source Data Summary Report 1, Operable Unit No 14, Radioactive Sites

### Action/No Further Action Recommendation

During the 1995 study for IHSS 164 1, all analytical data were collected in accordance with an approved workplan/SAP and were below the established PPRGs. Currently, all analysis are below RFCA Tier II action levels (DOE, 1996) and further, at or below established background levels for radionuclides. Sampling methodology for IHSS 164 1 was consistent with current SAPs as agreed upon in a meeting held May 18, 2000 with the Regulatory Agencies. No current or potential source of contamination was identified. Therefore, IHSS 164 1 is proposed for No Further Action based upon comparison of the analytical data to current RFCA action levels. The recommendation for NFA at this site is consistent with the criteria for recommending No Further Action decisions presented in RFCA (DOE, 1996).

### Comments

Research conducted in preparation for the HRR identifies the concrete slab as originating from the Building 776, 777 production facilities in 1957. This is believed to be an error because Building 776 first came online in 1957 and no fires related to the building are identified. It is likely that the reference to a fire is inferring to the fire associated with Building 771 in 1957 which is the likely origin of the concrete slab.

Analytical data from the Operable Unit 14, Phase I, RFI/RI (DOE, 1995) was provided to the Regulatory Agencies in 1999 and is located in the Administrative Record.

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000).

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Operable Unit 14, Radioactive Sites, Draft Data Summary 1, Vol 1*, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

**PAC REFERENCE NUMBER: 600-189**

IHSS Reference Number      189, Industrial Area Operable Unit  
Unit Name                      Nitric Acid Tanks (IAG Name Multiple Acid Spills)  
Approximate Location        N35,900, E19,600

Date(s) of Operation or Occurrence

1952 - 1996

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

The 218 Acid Tanks, also known as the Building 218 Acid Farm, are located adjacent to the railroad tracks east of Building 444 and south of Cottonwood Avenue. The tanks were used for the storage of nitric acid since 1952, and were assigned the facility number 218. The tanks supplied acid to Building 771 and Building 883 (DOE, 1992).

On October 27, 1982, a brown cloud of gas was observed coming from the Acid Tank Farm. No documentation was found explaining the incident (DOE, 1992).

An overflow occurred on September 25, 1985, during a filling operation. No documentation could be found pertaining to the quantity of acid released (DOE, 1992).

On June 28, 1986, the level probe in a dumpster tank failed, causing a release of nitric acid to the safety overflow and onto the ground. Approximately one gallon of acid was released to the ground surface (DOE, 1992).

Physical/Chemical Description of Constituents Released

Nitric acid was released to the environment in each of the occurrences.

Responses to Operation or Occurrence

Two containers of sodium bicarbonate were used to neutralize the September 1985 spill. The volume of the containers is unknown (DOE, 1992).

Following the June 1986 overflow incident, the Fire Department washed down, diluted and neutralized the acid with sodium bicarbonate (DOE, 1992).

IHSS 189 (PAC 600-189) was studied in accordance with the Operable Unit 12 investigation. No samples were collected during the study. The acid tanks were removed on September 29, 1996, as part of a plant-wide D&D schedule.

On June 29, 2000, each corner of the existing concrete berm (secondary containment) was surveyed showing the actual IHSS 189 boundary (see Appendix 4, Plate 1). Two inside locations were also marked for future sampling (Figure 2.6).

#### Fate of Constituents Released to Environment

No documentation was found which detailed the removal of soil affected by the nitric acid; however, it is believed that the acid was neutralized with sodium bicarbonate during the response to each spill. Due to the relatively small amount of acid spilled and the neutralization effect over time, the cumulative hazard indices for non-carcinogenic health effects are expected to be 0.01 or less and therefore no adverse non-cancer health effects are expected under the exposure conditions evaluated.

#### Action/No Further Action Recommendation

IHSS 189 was proposed for NFA in the 1997 Annual Update to the HRR based upon the health effects and exposure scenario mentioned above. Based upon comments received from the Regulatory Agencies on July 19, 1999, soil pH will be conducted at this location. Each surveyed corner and the two inner locations (six locations total) will be sampled consistent with sampling methodologies prescribed in the Industrial Area Sampling and Analysis Plan (draft at present; see Figure 2.6).

#### Comments

This IHSS was originally identified as Multiple Acid Spills, 800 Area. However, information from the CEARP source is vague. Interviewees for CEARP Phase 1 indicated that the "nitric acid receiving area (area 218) located north of Building 881" was the location of numerous small spills during acid transfer and operation. Other interviewees for the same document indicated the nitric acid farm west of Building 881 was the location for spills which were rinsed off onto the ground. RCRA 3004(u) did not place IHSS 189 on a map but defined the IHSS as multiple acid spills north and west of Building 881 (DOE, 1992).

It should be noted that, at one time, there were overhead acid lines between the 218 Tanks and the northwest side of Building 881. It is possible that lines were hit by vehicular traffic at times causing acid to spill onto the ground. This may have been a source of the referenced releases identified in CEARP as north and west of Building 881.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Technical Memorandum No 2, Operable Unit 12, 400/800 Areas, Draft*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, February

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2000, *IHSS 189 Survey Report*, Rocky Flats Environmental Technology Site, Golden, CO, June 29, 2000

**PAC REFERENCE NUMBER: 600-1001(a)**

IHSS Reference Number      Not Applicable

Unit Name                      Spills of Unknown Oil in PAC 600-1001 (SIR #318)

Approximate Location        N749,000, E2,083,000

Date(s) of Operation or Occurrence

June 23, 1997

Description of Operation or Occurrence

On June 23, 1997, while conducting a surveillance walk-down of the Building 663 Lay-down Yard (PAC 600-1001), two oil stained soil areas were identified immediately west of the building. The first stained area was approximately 10 feet west of the southwest corner of the building where a five-gallon bucket containing an oil-water mixture had overflowed due to recent rain. Stained soil around the bucket indicated that overflowing of the bucket had been ongoing for a prolonged period of time. During the assessment of the first finding, a second oil stain was identified approximately 100 feet north of the first where an abandoned piece of equipment was observed leaking what appeared to be hydraulic fluid onto the ground (soil). Radiological surveys were conducted at both sites followed by soil sampling and sampling of the unknown oil in the five-gallon bucket. The bucket and contents were placed into an overpack container and both oil stained areas were immediately cleaned up in accordance with plant procedures (RMRS, 1997).

Physical/Chemical Description of Constituents Released

Hazardous constituents which may be present due to past storage activities (refer to PAC Narrative 600-1001) include oil, still bottoms, perclene, waste coolant, and solids. Gasoline was released within PAC 600-1001 during a separate January 1990 incident (DOE, 1992).

Following the June 23, 1997 discovery, independent sampling was conducted of both soil stained areas and the liquid remaining in the five-gallon bucket for fingerprint analysis (oil), radiological screens, isotopic analysis (Pu, U, Am), total CLP metals, total VOAs, and polychlorinated biphenyls (PCBs). Cleanup verification analysis of the soil from both locations found undetected or background concentrations for all parameters analyzed.

Positive results for several compounds were identified in the liquid sample (shown below)

<u>Compound</u>	<u>Units (ppm)</u>
Ethylbenzene	43
Total Xylenes	260
1,1,1-Trichloroethane	230
1,2,4-Trimethylbenzene	100
N-Butylbenzene	44
Napthalene	61
1,3-Dichlorobenzene	25

#### Response to Operation or Occurrence

In response to the June 23, 1997 occurrence, the individual conducting the walk-down immediately notified supervision, the Shift Manager, and the RFETS Fire Department. The HAZMAT Team and Shift Superintendent responded to the site and initial radiological screening was conducted. Samples were collected from the liquid in the bucket and both soil areas. Gravel and soil from the two sites were containerized per plant procedure and transported to a RCRA permitted storage facility (RFETS Fire Dept Response Tracking 97-318).

#### Fate of Constituents Released to the Environment

With the exception of the June 23, 1997 occurrence, no documentation was found which detailed the fate of the constituents released to the environment (DOE, 1992). Sampling and analysis adequately characterized the compounds associated with the oil in the five-gallon bucket and stained soil in both areas. The area was immediately cleaned up in accordance with Plant procedures and the soil was containerized prior to transporting to a RCRA permitted storage facility. In addition, the five-gallon bucket and contents were overpacked prior to removal. There were no other contaminants associated with the release and the spill was verified to be cleaned up.

#### Action/No Further Action Recommendation

The 1997 Annual Update to the HRR initially reported this occurrence as an addition to the original PAC 600-1001 Narrative. Clarification was necessary based upon review of this narrative and it was decided in a meeting with the Agencies on May 18, 2000 to track the June 23, 1997 occurrence as PAC 600-1001(a). It was further agreed that PAC 600-1001(a) is approved as NFA as recommended.

#### Comments

PAC 600-1001 requires further investigation given the information provided in the HRR (DOE, 1992)

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000)

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1997, *Serious Incident Report #318*, Rocky Flats Environmental Technology Site, Golden, CO, June

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

RMRS, 1997, *Environmental Operations CERCLA History Files*, Rocky Flats Environmental Technology Site, Golden, CO, July

**PAC REFERENCE NUMBER: 700-123.1**

IHSS Reference Number 123 1, Industrial Area Operable Unit

Unit Name Valve Vault 7

Approximate Location N750,000, E2,084,000

Date(s) of Operation or Occurrence

April 4, 1983

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

Valve Vault 7 is located to the southwest of Building 707, adjacent to the north side of the Protected Area (PA) inner fence Valve Vault 7 controls the 800 Area main process waste line (DOE, 1992)

On April 4, 1983, a check valve in Valve Vault 7 malfunctioned allowing process wastewater to backflow into the sump The vault filled with process wastewater and overflowed The high water level alarm system in Valve Vault 7 was apparently inoperative at the time of the overflow (DOE, 1992) The process wastewater drained into an adjacent storm runoff collection system ditch near Eighth Street and Sage Avenue and flowed east toward South Walnut Creek and the B-Series drainage ponds Runoff was noticed flowing across the former 750 Parking Lot, the Building 991 normal runoff drainage (DOE, 1992)

Physical/Chemical Description of Constituents Released

The release consisted of process wastewater from the 800 and 400 Areas which typically contained uranium, solvents, oils, beryllium, nitric acid, hydrochloric acid, and fluoride (DOE, 1992)

Responses to Operation or Occurrence

The transfer of liquid waste from the holding tanks at Building 881 was discontinued after personnel verified that wastewater was flowing out of Valve Vault 7 Temporary dikes were constructed to contain the overflow (DOE, 1992) A dam was constructed in the ditch east of the guard shack at Portal #1 and another dam was placed just west of Guard Shack 762 Drainage from the area was diverted to Pond B-1 Attempts were made to remove oil by using chemical absorbent bats Environmental samples were taken from the vault and other areas of concern Water was pumped out of the vault and the containment dikes and transferred to Waste Processing by tanker truck Snow melt water was retained in the ditch for several days and later transferred to Process Waste Storage The malfunctioning check valve was replaced, the sump

pump was replaced and repair of the electrical system was initiated. A new type of check valve was ordered for all the check valves in the waste transfer system (DOE, 1992). The ditch along Sage Avenue between Valve Vault 7 and Ninth Street was cleaned of all visible contamination. The excavated material was stored for drying in the old Building 771 parking lot.

#### Fate of Constituents Released to Environment

The runoff diversion activities were partially successful. Oil from the spill was visible in Pond B-1. A small amount of oil was observed in Pond B-4 and Pond B-5. All visible contamination was excavated from the ditch along Ninth Street (DOE, 1992). No documentation was found which detailed the complete removal of release constituents from the site. Analysis of water samples from Pond B-1 and Pond B-4 one week following the incident indicated normal pH, and no concentrations of oil, nitrate, or radioactivity. Evaluation of data for Pond B-5, the only pond that discharged off site during that period did not indicate material from the spill. Pond B-5 water was to have been held for about two weeks after April 15, 1983 before being released to Great Western Reservoir. One reference indicated the environmental impact was negligible (DOE, 1992).

IHSS 123.1 (PAC 700-123.1) was studied in accordance with the IAG schedule for Operable Unit 8. As part of the Operable Unit 8, Phase I, RFI/RI (DOE, 1995), IHSS 123.1 was sampled at nine locations (see Figure 2.7) for inorganics, radionuclides, volatile organic compounds, and semi-volatile organic compounds. These data were validated, compared to background concentrations (if applicable), and then compared to soil action levels presented in Attachment 5 of RFCA. There were no detections with the exception of benzo(a)pyrene which was present in the sample but below the MDL (Table 2.5).

#### Action/No Further Action Recommendation

During the 1995 study for IHSS 123.1, all analytical data were collected in accordance with an approved workplan. All analysis were below RFCA Tier II action levels (DOE, 1996) and at or below established background levels for radionuclides. Sampling methodology for IHSS 123.1 was consistent with current SAPs and no current source of contamination could be identified. Therefore, IHSS 123.1 is proposed for No Further Action based upon comparison of the analytical data to current RFCA action levels. The recommendation for NFA at this site is consistent with the criteria for recommending No Further Action decisions presented in RFCA (DOE, 1996).

**Table 2.5 IHSS 123.1 Maximum Detected Compounds --  
RFCA Soil Action Level Comparison**

Description	Maximum Detected	Unit	Residential Use	Industrial Use	Maximum Detected	Yes	No	No
AMERICIUM-241	0 028	pCi/g	209	38	0 022	Yes	No	No
PLUTONIUM-239/240	0 11	pCi/g	1088	252	0 066	Yes	No	No
URANIUM-233,-234	1 2	pCi/g	1627	307	2 25	No	No	No
URANIUM-235	0 1	pCi/g	113	24	0 094	Yes	No	No
URANIUM-238	1 2	pCi/g	506	103	2	No	No	No
ALUMINUM	8650	mg/kg	>1E+06	>1E+06	16902	No	No	No
ANTIMONY	3	mg/kg	8 18E+02	8 18E+02	NA	NA	No	No
ARSENIC	4	mg/kg	3 81E+02	3 81E+00	10 09	No	No	No
BARIUM	137	mg/kg	1 34E+05	1 34E+05	141 26	No	No	No
BERYLLIUM	0	mg/kg	1 33E+02	1 33E+00	0 966	No	No	No
CADMIUM	0	mg/kg	1 33E+02	1 33E+00	1 612	No	No	No
CHROMIUM (Total)2	15	mg/kg	8 72E+03	1 02E+03	16 99	No	No	No
COBALT	11	mg/kg	1 23E+05	1 23E+05	10 91	Yes	No	No
COPPER	61	mg/kg	7 56E+04	7 56E+04	18 06	Yes	No	No
IRON	18500	mg/kg	7 56E+04	7 56E+04	18037	Yes	No	No
LEAD	18	mg/kg	1 00E+03	1 00E+03	54 62	No	No	No
LITHIUM	8	mg/kg	4 09E+04	4 09E+04	11 55	No	No	No
MANGANESE	473	mg/kg	4 09E+04	4 09E+04	365 08	Yes	No	No
MERCURY	0 06	mg/kg	6 13E+02	6 13E+02	0 134	No	No	No
MOLYBDENUM	1	mg/kg	1 02E+04	1 02E+04	NA	NA	No	No
NICKEL	12	mg/kg	4 09E+04	4 09E+04	14 91	No	No	No
SELENIUM	1	mg/kg	1 02E+04	1 02E+04	1 224	No	No	No
SILVER	2	mg/kg	1 02E+04	1 02E+04	NA	NA	No	No
STRONTIUM	44	mg/kg	>1E+06	>1E+06	48 94	No	No	No
TIN	2	mg/kg	>1E+06	>1E+06	NA	NA	No	No
VANADIUM	28	mg/kg	1 43E+04	1 43E+04	45 59	No	No	No
ZINC	474	mg/kg	1 43E+04	1 43E+04	73 76	Yes	No	No
1,2,4-TRICHLOROBENZENE	0 37	mg/kg	2 04E+04	2 04E+04	NA	NA	No	No
1,2-DICHLOROBENZENE	0 37	mg/kg	1 84E+05	1 84E+05	NA	NA	No	No
1,4-DICHLOROBENZENE	0 37	mg/kg	2 38E+04	2 38E+02	NA	NA	No	No
2,4,5-TRICHLOROPHENOL	1 8	mg/kg	2 04E+05	2 04E+05	NA	NA	No	No
2 4,6-TRICHLOROPHENOL	0 37	mg/kg	5 20E+04	5 20E+02	NA	NA	No	No
2 4-DICHLOROPHENOL	0 37	mg/kg	6 13E+03	6 13E+03	NA	NA	No	No
2 4-DIMETHYLPHENOL	0 37	mg/kg	4 09E+04	4 09E+04	NA	NA	No	No
2 4-DINITROPHENOL	1 8	mg/kg	4 09E+05	4 09E+03	NA	NA	No	No
2 4-DINITROTOLUENE	0 37	mg/kg	8 42E+02	8 42E+00	NA	NA	No	No
2 6-DINITROTOLUENE	0 37	mg/kg	8 42E+02	8 42E+00	NA	NA	No	No
2-CHLORONAPHTHALENE	0 37	mg/kg	1 64E+05	1 64E+05	NA	NA	No	No
2-CHLOROPHENOL	0 37	mg/kg	1 02E+04	1 02E+04	NA	NA	No	No
2-METHYLNAPHTHALENE	0 37	mg/kg	8 18E+04	8 18E+04	NA	NA	No	No
2-METHYLPHENOL	0 37	mg/kg	1 02E+05	1 02E+05	NA	NA	No	No
2-NITROANILINE	1 8	mg/kg	1 23E+02	1 23E+02	NA	NA	No	No
3 3-DICHLOROBENZIDINE	0 74	mg/kg	1 27E+03	1 27E+01	NA	NA	No	No

**Table 2.5 IHSS 123.1 Maximum Detected Compounds –  
RFCA Soil Action Level Comparison (cont.)**

Description	Maximum Detected	Units	Tier I Industrial Use	Tier II Industrial Use	Background	Chromium	Chromium	Chromium
4,6-DINITRO-2-METHYLPHENOL	1.8	mg/kg	2.04E+02	2.04E+02	NA	NA	No	No
4-CHLOROANILINE	0.37	mg/kg	8.18E+03	8.18E+03	NA	NA	No	No
4-METHYLPHENOL	0.37	mg/kg	1.02E+04	1.02E+04	NA	NA	No	No
4-NITROPHENOL	1.8	mg/kg	1.64E+04	1.64E+04	NA	NA	No	No
ACENAPHTHENE	0.37	mg/kg	1.23E+05	1.23E+05	NA	NA	No	No
ANTHRACENE	0.37	mg/kg	6.13E+05	6.13E+05	NA	NA	No	No
BENZO(a)ANTHRACENE	0.37	mg/kg	7.84E+02	7.84E+00	NA	NA	No	No
BENZO(a)PYRENE	0.36	mg/kg	7.80E+03	7.84E-01	NA	NA	No	No
BENZO(b)FLUORANTHENE	0.36	mg/kg	7.84E+02	7.84E+00	NA	NA	No	No
BENZO(k)FLUORANTHENE	0.37	mg/kg	7.84E+03	7.84E+01	NA	NA	No	No
BENZOIC ACID	1.8	mg/kg	>1E+06	>1E+06	NA	NA	No	No
BENZYL ALCOHOL	0.37	mg/kg	6.13E+05	6.13E+05	NA	NA	No	No
BIS(2-CHLOROETHYL)ETHER	0.37	mg/kg	5.20E+02	5.20E+00	NA	NA	No	No
BIS(2-CHLOROISOPROPYL)ETHER	0.37	mg/kg	8.17E+03	8.17E+01	NA	NA	No	No
BIS(2-ETHYLHEXYL)PHTHALATE	0.37	mg/kg	4.09E+04	4.09E+02	NA	NA	No	No
BUTYL BENZYL PHTHALATE	0.37	mg/kg	4.09E+05	4.09E+05	NA	NA	No	No
CHRYSENE	0.36	mg/kg	7.84E+04	7.84E+02	NA	NA	No	No
DIBENZO(a,h)ANTHRACENE	0.37	mg/kg	7.84E+01	7.84E-01	NA	NA	No	No
DIBENZOFURAN	0.37	mg/kg	8.18E+03	8.18E+03	NA	NA	No	No
DIETHYL PHTHALATE	0.37	mg/kg	>1E+06	>1E+06	NA	NA	No	No
DIMETHYL PHTHALATE	0.37	mg/kg	>1E+06	>1E+06	NA	NA	No	No
DI-n-OCTYL PHTHALATE	0.37	mg/kg	>1E+06	4.09E+04	NA	NA	No	No
FLUORANTHENE	0.36	mg/kg	8.18E+04	8.18E+04	NA	NA	No	No
FLUORENE	0.37	mg/kg	8.18E+04	8.18E+04	NA	NA	No	No
FLUORIDE	0.004	mg/kg	1.23E+05	1.23E+05	NA	NA	No	No
HEXACHLOROBENZENE	0.37	mg/kg	2.58E+02	3.58E+00	NA	NA	No	No
HEXACHLOROBUTADIENE	0.37	mg/kg	7.34E+03	7.30E+03	NA	NA	No	No
HEXACHLOROCYCLOPENTADIENE	0.37	mg/kg	1.37E+04	1.37E+04	NA	NA	No	No
HEXACHLOROETHANE	0.37	mg/kg	4.09E+04	4.09E+02	NA	NA	No	No
INDENO(1,2,3-cd)PYRENE	0.37	mg/kg	7.84E+02	7.84E+00	NA	NA	No	No
ISOPHORONE	0.37	mg/kg	6.02E+05	6.02E+03	NA	NA	No	No
NAPHTHALENE	0.37	mg/kg	8.18E+04	8.18E+04	NA	NA	No	No
NITROBENZENE	0.37	mg/kg	1.02E+03	1.02E+03	NA	NA	No	No
N-NITROSO-DI-n-PROPYLAMINE	0.37	mg/kg	8.17E+01	8.17E-01	NA	NA	No	No
N-NITROSODIPHENYLAMINE	0.37	mg/kg	1.17E+05	1.17E+03	NA	NA	No	No
PENTACHLOROPHENOL	1.8	mg/kg	4.77E+03	4.77E+01	NA	NA	No	No
PHENOL	0.37	mg/kg	>1E+06	>1E+06	NA	NA	No	No
PYRENE	0.36	mg/kg	6.13E+04	6.13E+04	NA	NA	No	No

NA Not Applicable

1 Background concentration defacto Tier II action level

2 Chromium - Tier I action level for Chrome III, Tier II action level for Chrome VI

### Comments

Analytical data from the Operable Unit 8, Phase I, RFI/RI (DOE, 1995) was provided to the Regulatory Agencies in 1999 and is located in the Administrative Record

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000)

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1994, *Phase I RFI/RI Work Plan for Operable Unit 8, 700 Area, Vol 1*, Rocky Flats Environmental Technology Site, Golden, CO, October

DOE, 1995, *Operable Unit 8, Data Summary Report, 700 Area, Vol 1*, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August

**PAC REFERENCE NUMBER: 700-1102**

IHSS Reference Number      Not Applicable

Unit Name                      Transformer Leak - 776-4

Approximate Location        N750,500, E2,083,500

Date(s) of Operation or Occurrence

Prior to January, 1986

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

Prior to January 1986, Transformer 776-4 was located approximately 100 feet west of the northwest corner of Building 776 (see Figure 2 8) The transformer pad at this location was positioned on an incline with drainage toward an access road 15 feet to the east In January 1986, a plant employee reported that a leak was observed from Transformer 776-4 In February 1986, the transformer was again reported to be leaking on the radiator, around the gauges, valves, and bushing compartment There was an oily film on most of the surfaces of the transformer and on the transformer pad In an August 1986 photograph, staining was visible on the concrete pad beneath the transformer Further leaking was reported in August and September of 1986 Samples collected in November 1986 of the concrete under the transformer drain valve and of soil at the south edge of the transformer pad was found to be contaminated with PCBs (DOE, 1992) The transformer was moved to a new pad several feet to the north in 1987 (DOE, 1996b)

Physical/Chemical Description of Constituents Released

In September 1976, the fluid in Transformer 776-4 had a PCB concentration of approximately 5 percent Samples of the oil collected in November 1977, indicate that the fluid in the transformer had a PCB concentration of approximately 3 percent. However, in October 1985, it was reported to have contained PCB oil (>500 ppm) In November 1986, wipe samples collected from a valve, side-wall, and the concrete pad were found to contain 29 8, 5 0, and 417 5 ppm PCBs, respectively Also in November 1986, a wipe sample collected from the concrete pad beneath the drain valve was found to contain 498  $\mu\text{g}/\text{cm}^2$  PCBs Soil in the bottom of the excavation at the south edge of the transformer pad showed 14,900 ppm PCB contamination (DOE, 1992)

Response to Operation or Occurrence

In September 1976, Transformer 776-4 was documented as being drained and refilled with a non-PCB silicone oil The transformer was scheduled for replacement under the PCB Fire Hazard Elimination Project in Fiscal Year 1988 The transformer was removed for retrofilling and relocated several feet to the north in 1987

63

The old transformer pad surface was partially removed (scabbled) to a depth of 4 inches and left in place

In March 1989, it was reported that transformer 776-4 was replaced under the Environmental Hazards Elimination Project. Further remediation of the site was scheduled on August 10, 1989 (DOE, 1992)

During a site-wide sampling program in August 1991, soil samples were collected in accordance with Agency approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration found in soil collected adjacent to the old concrete transformer pad was 480 ppm (DOE, 1996b)

Working under an agency approved Final PAM for Remediation of Polychlorinated Biphenyls (DOE, 1995), additional samples were collected in 1995 and 1996 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Draft Method 4020 and concrete samples were analyzed using EPA Method 8080. Based upon analytical results for the concrete samples, the highest PCB contamination level on the concrete pad was 56 ppm. In accordance with the PAM (DOE, 1995), approximately 177 cubic yards of PCB-contaminated soil and 10.7 cubic yards of PCB-contaminated concrete were excavated to a total depth of 17 feet, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal (DOE, 1997). An area of soil approximately 20 square feet, at the bottom of the excavation, remains PCB-contaminated. Soil was remediated to 70 ppm using EPA Method 8080 as documented in the Closeout Report for the Source Removal of Polychlorinated Biphenyls (DOE, 1997). Excavation was stopped due to equipment limitations and health and safety concerns.

#### Fate of Constituents Released to Environment

No historical documentation was found that detailed the disposition of the concrete removed from the transformer pad in 1988 or the fate of constituents released to the environment (DOE, 1992)

PAC 700-1102 was remediated from an initial PCB contaminant level of 480 ppm Aroclor-1260 in the soil to 70 ppm. Because the residual contamination is 17 feet below ground surface, the source removal significantly reduced risk to human health and the environment (DOE, 1997). RFCA Tier I sub-surface soil action levels for Aroclor-1260 are 3,820 ppm. This site was recommended for no further action in 1997, however, comments received from the Regulatory Agencies on July 19, 1999 conclude that additional groundwater samples should be collected to ensure that PCB contamination is not mobilized in the sub-surface.

### Action/No Further Action Recommendation

It is anticipated that in early Fiscal Year 2001, additional down-gradient groundwater samples will be collected for PCBs either from nearby monitoring wells (if water is present) or from the underground tunnel connecting Buildings 776 and 771. The tunnel annex is immediately east of PAC 700-1102, approximately 23 feet in depth, and is known to contain sufficient groundwater for sampling.

### Comments

The excavation was filled with clean structural backfill in 1996.

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066 UN, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 1996a, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 1996b, *Annual Update for the Historical Release Report, August 1, 1995 through August 1, 1996*, RF/ER-96-0046, September

DOE, 1997, *Closeout Report for the Source Removal of PCBs*, RF/RMRS-97-044, Revision 0, July

RMRS, 1997, *Annual Update to the Historical Release Report*, Rocky Flats Environmental Technology Site, Golden, CO, September

**PAC REFERENCE NUMBER: 900-108**

IHSS Reference Number 108, Buffer Zone Operable Unit

Unit Name Trench T-1

Approximate Location N749,500, E2,086,000

Date(s) of Operation or Occurrence

November 1954 - December 1962

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

Historical documents indicate that at least 125 drums of depleted uranium chips and lathe coolant were buried in Trench 1 located northwest of Gate 9 and adjacent to the Building 901 Guard Tower (Figure 2 9) The original Trench T-1 dimensions were approximately 200 ft long, 15 ft wide, and 5 ft deep however, documentation indicates that the trench was extended in 1955 The drums were covered with two feet of soil and the corners of the trench were marked (DOE, 1992)

The drums buried in Trench 1 consisted of potentially pyrophoric uranium oxide from Building 444 and off-Site sources Drum packing methods are unclear and may have varied.

A report from November 1954 described a procedure for placing 30-gallon drums of combustible material inside 55-gallon drums of graphite Six of these drums were placed in a trench described as being in the same area as Trench T-1 It is unclear whether this was the burial method for all drums in the trench (DOE, 1992)

In October 1982, a metal drum was punctured during routine weed cutting. The drum contained a mixture of water and oil The liquid was pumped into a new drum to await disposal Another account of a 1982 event may describe the same or a similar incident involving two drums uncovered by weed cutting activities One drum reportedly contained an oily sludge with 4 3 picocuries per gram (pCi/g) plutonium and 1 2 microcuries per gram (uCi/g) uranium (DOE, 1992)

### Physical/Chemical Description of Constituents Released

Approximately 25,000 kilograms of depleted uranium chips were contained in the estimated 125 buried drums (DOE, 1992)

An inventory receipt records 38 drums disposed in the trench from November 17, 1954 to June 1, 1956. Most of the records indicate the contents to be metal turnings and still bottoms (residue from a distillation process), although 10 drums contained cemented cyanide waste. The drums of concreted cyanide were placed in the same trench as highly combustible waste from Building 444. Some of the drums contained copper alloy (DOE, 1992)

Inventory lists indicating the number of drums of oil disposed by on-site burning or burial and the origin of the drums are available from April 1954 through April 1966 with the exception of a gap from August 1957 through August 1958. Eighty-five of the estimated 125 drums are documented in this record (DOE, 1992)

Two drums of "special" wastes from Building 444 which were placed in the trench in 1955 were removed and returned to Building 444 in 1956 at the request of the Accountability Group (DOE, 1992)

In 1958, authorization was granted for additional disposal in the trench of over 15,000 pounds of depleted uranium chips from Building 444. In 1962, authorization was again given for the disposal of approximately 7,500 pounds of depleted uranium chips (DOE, 1992). The depleted uranium chips were containerized in drums.

### Responses to Operation or Occurrence

A radiometric survey was performed in the area in October 1977 that identified four small hot spots ranging from 500 to 18,000 cpm of activity. The spots were marked and mapped. A radiometric survey was performed in June 1980 which identified numerous hot spots suspected to be depleted uranium. Two boxes of uranium-contaminated soil were removed from the southeast corner of the Perimeter Security Zone (PSZ) in the spring of 1982 during construction of the PSZ. It is not clear if the material removed is associated with the Oil Burn Pit (IHSS 153) or the trench. Additionally, several monitoring wells were installed in October 1987 (DOE, 1992)

In the summer of 1995, electromagnetic surveys and ground penetrating radar confirmed the presence of drums and/or metallic objects in the Trench T-1 location. The surveys indicate that a majority of the metallic objects were located in the westernmost half of the trench (DOE, 1997)

A PAM to remediate the site as part of a CERCLA Accelerated Source Removal Action was approved by the Regulatory Agencies in April 1998 (RMRS, 1998a). The excavation phase of the source removal action was initiated on June 10, 1998 and completed on August 20, 1998. The action included the excavation of materials buried in the trench, segregation of material during excavation and packaging of the waste streams based on waste type. The excavated

trench length was 230 ft with 160 drums of depleted uranium and 10 drums of cemented cyanide removed from the excavation. Most of the Trench 1 waste is being stored in RCRA Unit 15 after initially being stored in an area on the north side of the Trench 1 project site within a Temporary Unit established for the project waste. A field modification to the PAM was made to allow movement to and storage of T-1 remediation wastes in RCRA Unit 15 (Kaiser-Hill, 1999).

Because VOCs and PCBs were detected at or above regulatory thresholds (i.e., RCRA, TSCA) in the drums of depleted uranium, the material could not be shipped to the treatment subcontractor for recycle as planned in the PAM. The Trench 1 waste will remain in interim storage at Rocky Flats until an off-site treatment process or disposal site can be identified and the waste can be shipped for off-site disposal (Kaiser-Hill, 1999).

#### Fate of Constituents Released to Environment

The removal action was completed and verification samples were collected from the excavation bottom and side-walls (Figure 2 10). Sampling was performed in accordance with the Sampling and Analysis Plan to Support the Source Removal at the Trench T-1 Site, IHSS 108 (RMRS, 1998b). Samples were collected and analyzed for radionuclides, VOCs, PCBs (as appropriate), and cyanide (as appropriate). Based on validated analytical results, the T-1 Closeout Report (RMRS, 1999) concluded that the trench has been successfully remediated relative to RFCA action levels and cleanup levels as specified in the PAM.

Sampling of the clean soil stockpile (segregated using a FIDLER and organic vapor analyzers during excavation) was performed in accordance with the Project SAP. Results indicate, using the 95% Upper Confidence Level, that action levels specified in the PAM were met. This soil stockpile was therefore returned to the excavation.

In addition, soil from 1,434 drums of Investigation Derived Material (IDM) was returned to T-1 as part of the trench back-filling operations. Approval for placement of this material was given by the EPA with concurrence by the CDPHE (RMRS, 1999). These and other T-1 actions are documented in the Closeout Report generated for the project (RMRS, 1999).

#### Action/No Further Action Recommendation

No further action is warranted for Trench T-1 and therefore IHSS 900-108 is being proposed for NFA at this time. A source removal action was completed in the summer of 1998. This action was authorized by an approved PAM. The removal action was completed and verification samples were collected from the excavation bottom and side-walls. Sampling was performed in accordance with the approved SAP.

Based on validated analytical results, the trench was successfully remediated to RFCA action levels and cleanup levels specified in the PAM

A Closeout Report for the project was prepared and serves as the reference document for all activities and analytical data associated with the project (RMRS, 1999) The closeout report documents the waste and contaminants removed, the condition of the excavation following the removal action and analytical results Because the source of contamination was successfully removed, IHSS 108 meets the criteria set forth in RFCA (DOE, 1996) for NFA

As requested by the Regulatory Agencies (CDPHE/EPA, 2000), the status of the search for a treatment process, and offsite facility that meets regulatory requirements for the CERCLA/RCRA/TSCA/Low Level mixed waste, will be reported in the 4<sup>th</sup> Quarter RFCA report or as part of an overall Site waste management report The status and disposition of the other waste types including soils, excavated debris and cemented cyanide wastes, will also be reported

#### Comments

During backfilling operations on December 18, 1998, a five-gallon container was discovered in the north sidewall of the trench The contents of the container were sample bottles which were rendered inert, sampled and then placed in a 55-gallon steel drum on a layer of soil and appropriately dispositioned as waste to be shipped offsite (RMRS, 1999)

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000)

#### References

CDPHE, EPA, 2000, *Letter from Steven Gunderson and Tim Rehder to Joe Legare re Annual Update for the Historical Release Report (September 1999)*, June 23

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, CDPHE and EPA, 1996, *Final Rocky Flats Cleanup Agreement*, July 19

DOE, 1997, *Annual Update for the Historical Release Report*, RF/RMRS-97-073 UN , Rocky Flats Environmental Technology Site, Golden, CO, September

Kaiser-Hill, 1999, *Field Modification to PAM for T-1 Project*, attachment to email from Tom Greengard to Gary Kleeman and Carl Spreng, May 27

Kaiser-Hill, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO , August

Putzier, 1970, *A Summary of On-Site Radioactive Waste Disposal*, E A Putzier, April 22

RMRS, 1998a, *Final Proposed Action Memorandum for the Source Removal at Trench 1, IHSS 108*, RF/RMRS-97-001, Rocky Flats Environmental Technology Site, Golden, CO, February

RMRS, 1998b, *Sampling and Analysis Plan to Support the Source Removal at the Trench T-1 Site, IHSS 108*, RF/RMRS-98-205 Rocky Flats Environmental Technology Site, Golden, CO, April

RMRS, 1999, *Closeout Report for the Source Removal at the Trench 1 Site IHSS 108*, RF/RMRS-99-302 UN, Rocky Flats Environmental Technology Site, Golden, CO, Rev , 0, June

**PAC REFERENCE NUMBER: 900-112**

IHSS Reference Number 112, Buffer Zone Operable Unit

Unit Name 903 Pad

Approximate Location N749,000, E2,086,000

Date(s) of Operation or Occurrence

1958 - 1968

Description of Operation or Occurrence

Releases at the 903 Pad (IHSS 112) are considered the primary source of radiological contamination in the surficial soil in this part of RFETS. Drums that contained hydraulic fluids and lathe coolant contaminated with plutonium and uranium were stored at this location from the summer of 1958 to January 1967. Approximately three fourths of the drums contained plutonium-contaminated liquids while most of the remaining drums contained uranium-contaminated liquids. Of the drums containing plutonium, the liquid was primarily lathe coolant and carbon tetrachloride in varying proportions. Also stored in the drums were vacuum pump oils, trichloroethene (TCE), perchloroethylene, silicone oils, and acetone still bottoms (DOE, 1995, RMRS, 1997).

Leaking drums were noted in 1964 during routine handling operations. The contents of the leaking drums were transferred to new drums, and the area was fenced to restrict access (DOE, 1992). From 1968 through 1970, some of the radiologically contaminated material was removed, the surrounding area was re-graded, and much of the area was covered by an imported base material and an asphalt cap. However, during drum removal and remedial activities, wind and rain spread plutonium-contaminated soils to the east and southeast from the 903 Pad area resulting in IHSS 155 (903 Lip Area).

Physical/Chemical Description of Constituents Released

When remedial operations began in 1967, a total of 5,237 drums were at the 903 Pad. Approximately 420 drums leaked to some degree. Of these, an estimated 50 drums leaked their entire contents. The total amount of leaked material was originally estimated at around 5,000 gallons of contaminated liquid containing approximately 86 grams of plutonium (DOE, 1995).

Responses to Operation or Occurrence

Contaminated areas around the leaking waste drums detected in 1964 were covered with fill dirt as a temporary measure. Signs warning of contamination were then posted. In November 1964, fencing was placed around the drum storage area. Air samplers at the east fence detected contamination following high winds (DOE, 1992).

Building 903A was constructed in 1966 to filter and transfer contaminated oil from leaking drums. The building was used to pre-filter the oil from the drums on the 903 Pad that could not be safely moved to Building 774. Oil filtered in Building 903A was then transferred to Building 774 for final processing. The pre-filtering process was considered too time consuming and the step was eliminated several months after it began (DOE, 1992).

Drum removal from the area began in January 1967 for drums that were in the storage area for six months or less. In August 1967, soil and rocks contaminated by rainwater runoff from the fenced area (east and down-gradient of the storage area) were shoveled up and deposited inside the fence. An attempt was made to re-grade the surface to prevent a recurrence of the contamination spread (DOE, 1992). In June 1968, the drums and pallets were cleared from the area and shipped off-Site in waste boxes. The 100,000-ft<sup>2</sup> area was contaminated with activities ranging from 2,000 to 300,000 dpm per 100 cm<sup>2</sup>. Depth of contamination was to 8 inches or more, possibly up to 18 inches. Vegetation was burned off the area in October 1968 in preparation for soil remediation (DOE, 1992).

In November 1968, six contaminated holding tanks located outside of Building 903 used in the filtering process were disconnected and crated for shipment as radioactive waste. The radioactively contaminated fence from around the 903 Pad was also shipped off-Site as were two forklifts used in the drum transfer activity. Building 904 which had been adjacent to Building 903A was moved to a location east of the Fire Barn (Building 331). Building 903A was moved to a location immediately east of Building 666 in 1991 (DOE, 1992).

The soil in the area exhibiting the greatest contamination was covered with fill material, soil sterilant, asphalt prime coat, and asphalt in November 1969. The area covered with asphalt was 148,104 ft<sup>2</sup>. Adjacent areas, specifically, but not limited to, the southeast, had high activity in surficial soils. Some of the soil to the southeast in the 903 Lip Area that had the highest activity readings indicated by several surveys was removed (DOE, 1992). Modification to the topography in and around the 903 Pad was completed in April 1971 to allow runoff to flow into Pond C-1 on Woman Creek (DOE, 1992).

Several investigations have been conducted at the 903 Pad to evaluate the extent of contamination. The data collected from these investigations have been reported in the Operable Unit (OU) 2 Phase II, RFI/RI Report (DOE, 1995). In addition, the Final SAP for the Site Characterization of the 903 Drum Storage Area (IHSS 112), 903 Lip Area (IHSS 155), and Americium Zone (RMRS, 1998) was implemented in 1998 and 1999 to further characterize and define the volume of soils exceeding RFCA Tier I and Tier II Radionuclide Soil Action Levels (RSALs) and for VOCs exceeding soil action levels (DOE, 1996).

#### Fate of Constituents Released to Environment

The most comprehensive investigation of soil contamination at the 903 Pad was conducted during the implementation of the Final Sampling and Analysis Plan for the Site Characterization of the 903 Drum Storage Area (IHSS 112), 903 Lip Area (IHSS 155), and Americium Zone (RMRS, 1998). The characterization effort included the completion of 25 boreholes at the 903

Pad for the radiological contamination assessment VOC samples were collected from a total of 18 boreholes at and adjacent to the 903 Pad. Soil samples were also analyzed for radionuclides from these 18 boreholes. The sampling effort also included the collection of soil samples and measurements outside of the 903 Pad. Thirty-seven boreholes were completed in the 903 Lip Area to assess radiological contamination. A total of 1,110 radiological measurements were collected in the Americium Zone to characterize undisturbed surface soils.

### *Surface and Subsurface Soils*

Results of surface and subsurface soil samples collected for this investigation are provided in the Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone (DOE, 2000). The results were compared to RFCA (DOE, 1996) RSALs for open space revealing that approximately 1.5 acres beneath the 903 Pad exceed Tier I action levels to a depth of two feet below the top of asphalt. Approximately 2.5 acres beneath the 903 Pad exceed Tier II RSALs to a depth of two feet below the top of asphalt. Subsurface soils were also compared to soil action levels for VOCs where approximately 0.25 acres exceed Tier I soil action levels to a depth of 19.8 feet below the top of asphalt. Subsurface soils exceeding Tier II action levels were encountered over approximately 0.5 acres to a depth of 25 feet below top of asphalt. The primary organic contaminants detected in subsurface soils include methylene chloride, tetrachloroethene, trichloroethene, and cis-1,2-dichloroethene. Figures 2.11, 2.12, 2.13, and 2.14 provide the extent of soil contamination in excess of Tier I RSALs, Tier II RSALs, and VOCs, respectively.

### *Groundwater*

The Monitoring of the 903 Pad/Ryan's Pit Plume Technical Memorandum (DOE, 1999) provides the most recent compilation of groundwater data for the 903 Pad. The objective of the technical memorandum was to evaluate the potential for impacts to surface water quality. Three additional groundwater-monitoring wells were installed in support of the evaluation. Two of the wells were installed down-gradient of the leading edge of the groundwater plume. The third well replaced an existing temporary well within the plume boundary.

The technical memorandum provides figures depicting the extent of the groundwater plume (total VOCs) originating at the 903 Pad and Ryan's Pit. Groundwater plumes originating at the 903 Pad migrate eastward through the Lip Area before deflecting to the north toward Walnut Creek and to the south toward the South Interceptor Ditch (SID). The groundwater plume originating at Ryan's Pit is migrating toward the southeast. Both Tier I and Tier II action level exceedances for VOCs have been detected in groundwater samples collected from monitoring wells, however surface water has not been impacted by the groundwater plumes.

#### Based on the Monitoring of the 903 Pad/Ryan's Pit Plume Technical Memorandum

- Concentrations of contaminants at the leading edge of the plume are monitored to substantiate the evidence that natural attenuation is occurring and to confirm that plume migration is not mobilized or that the plume is moving very slowly,
- The presence of reductive dechlorination products of the three contaminants of concern (trichloroethene, carbon tetrachloride, and tetrachloroethene) suggests that small quantities of the original release might have degraded. The degradation products appear to be consistent with hydrogenolysis,
- Hydrogeologic factors appear to have a greater impact on contaminant migration than degradation processes. It is likely that this is attributable to a low overall groundwater flux, and
- There is no evidence that the 903 Pad/Ryan's Pit plume is currently impacting surface water quality at this time (RMRS, 1997).

Based on a review of the data, RFETS, EPA, and CDPHE have agreed that monitoring would be the best approach of the 903 Pad/Ryan's Pit plume to assess natural attenuation and potential groundwater impacts to surface water quality. Monitoring has been integrated into the IMP and will be performed quarterly. Source removal of the 903 Pad will address the source area contamination and reduce the influx of additional contaminants into the groundwater.

#### Action/No Further Action Recommendation

As discussed above, the site characterization of IHSS 112 has been completed. Tier I exceedances in surface and subsurface soil requires an action as discussed in action level framework (ALF) of RFCA. An IM/IRA decision document will be initiated to address soils in the 903 Pad, as well as the 903 Lip Area and Americium Zone in 2002.

#### Comments

None

## References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Final Phase II RFI/RI Report, 903 Pad, Mound, East Trenches Area, Operable Unit No 2*, RF/ER-95-0079 UN, U S Department of Energy, Rocky Flats Plant, Golden, CO 80402

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO 80402

DOE, 2000, *Characterization Report for the 903 Drum Storage Area, 903 Lip Area and Americium Zone*, RF/RMRS-99-427 UN, Rocky Flats Environmental Technology Site, Golden, CO. June

RMRS, 1997, *903 Drum Storage Area, 903 Lip Area and Americium Zone Data Summary*, RF/RMRS-97-086-UN, Rocky Flats Environmental Technology Site, Golden, CO. September

RMRS, 1998, *Sampling and Analysis Plan for the Site Characterization of the 903 Drum Storage Area, 903 Lip Area and Americium Zone*, RF/RMRS-97-084, Rev 1, Rocky Flats Environmental Technology Site, Golden, CO August

**PAC REFERENCE NUMBER: 900-140**

IHSS Reference Number            140, Buffer Zone Operable Unit

Unit Name                            Hazardous Disposal Site (IAG Name Reactive Metal  
   Destruction Site)

Approximate Location            N748,500, E2,086,000

Date(s) of Operation or Occurrence

1956 - 1970

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

An area in the southeast portion of the 400-acre manufacturing area was used for the destruction and disposal of reactive metals and other chemicals. Metallic lithium was destroyed on the ground in the 1950s and 1960s. The activity was described in 1967 as lithium waste being disposed of in a trench, moistened, and then covered with fill at the southeast corner of the site. After the reaction, the residues were buried. Unknown quantities of other reactive metals (sodium, calcium, and magnesium) and some solvents were also destroyed at this location (DOE, 1992).

The area was fenced to prevent unauthorized personnel from accessing the area. Signs along the fence indicated that the area was a Hazardous Disposal Site (DOE, 1992).

Physical/Chemical Description of Constituents Released

Approximately 400 to 500 pounds of lithium were destroyed and the residues, primarily lithium carbonate, buried. It is believed that nine bottles of nickel carbonyl and one can of iron carbonyl were disposed of in this area in March 1969. No documentation was found which further detailed specific constituents released, including radionuclides (DOE, 1992). The Phase II RFI/RI report for OU 2 stated that, in addition to lithium, other elements and compounds destroyed at this site include sodium, calcium, magnesium, solvents, and unknown liquids (DOE, 1995).

Responses to Operation or Occurrence

As part of the Phase II RFI/RI investigation for OU 2, nine boreholes were drilled to delineate the nature and extent of contamination associated with IHSS 140. The samples were analyzed for VOCs, SVOCs, metals, pesticides, PCBs and radionuclides. The analytical results were summarized in the Phase II RFI/RI Report, 903 Pad, Mound and East Trenches Area, OU 2 (DOE, 1995).

## Fate of Constituents Released to Environment

Because the area affected by the releases associated with IHSS 140 was buried, the IHSS represents a potential source of subsurface contamination. The results of the Phase II RFI/RI for OU 2 were used to assess the nature and extent of contamination and fate of the chemicals of concern. The concentration mean and concentration range for the previously presented chemicals of concern detected within IHSS 140 are presented in Table 2.6 along with the corresponding RFCA Tier I and II subsurface soil action levels.

**Table 2.6 RFCA Subsurface Soil Action Levels (DOE, 1996a) and IHSS 140 Analytical Results for Soil (DOE, 1995)**

Analyte	RFCA Tier I Subsurface Soil Action	RFCA Tier II Subsurface Soil Action	Concentration Mean	Concentration range
<b>Volatile Organics (mg/Kg)</b>				
Carbon Tetrachloride	3 560	0 036	0 037	0 002J-0 1
Cis-1,3 - dichloropropene	0 120	0 001	0 006J	0 006J
Methylene chloride	0 578	0 006	0 008	0 002BJ-0 032B
Tetrachloroethene	3 150	0 032	0 041	0 002J-0 21
Trichloroethene	3 280	0 033	0 014	0 001J-0 044
<b>Metals (mg/Kg)<sup>c</sup></b>				
Cadmium	1920	1920	2 8	1 8 - 5 4
<b>Radionuclides (pCi/g)<sup>d</sup></b>				
Americium-241	215	38	1 45	0 01J - 12
Plutonium-239/240	1429	252	38	0 03 - 83
Uranium-233/234	1738	307	20 3	2 8 - 55B
Uranium-235	135	24	2 1	2 1
Uranium-238	586	103	5 3	1 8 - 15B

J Compound was detected below the Practical Quantitation Limit (PQL). Quantitation was estimated.

B Compound was detected in the Method Blank.

c RFCA Tier I & Tier II Action Levels for Open Space Use

d RFCA Tier I Action Levels for Open Space Use

## Action/No Further Action Recommendation

As indicated in Table 2.6, the average concentration of organic chemicals of concern in subsurface soils detected in IHSS 140 were above the RFCA Tier II subsurface soil action levels. Exceedances of Tier II subsurface soil action levels require that an evaluation be made to determine if an action is necessary to protect surface water or ecological resources. If an action is shown to be necessary, a process to identify, evaluate, and implement efficient, cost effective, and feasible remediation or management actions will be triggered. The IHSS will be evaluated further to determine if an action is necessary to protect surface water or ecological resources.

Radionuclide contamination in surface soil overlying IHSS 140, was evaluated during the implementation of the 903 Drum Storage Area (IHSS 112), 903 Lip Area (IHSS 155), and the Americium Zone characterization activities. Results of the investigation are provided in the Characterization Report of the 903 Drum Storage Area, 903 Lip Area, and Americium Zone (KH, 2000). Results indicate that both Tier I and II radionuclide soil action levels for open space use are exceeded within the boundary of IHSS 140. Actions based on these exceedances will be evaluated with 903 Drum Storage, Lip Area and Americium Zone interim measures/interim remedial action (IM/IRA).

#### Comments

IHSS 140 overlaps with IHSS 155 and the gas storage building IHSS 183 (Building 952), that was moved into the area in 1967. Destruction of gases as an activity near Building 952 may have been performed in this area. Aerial photographs from 1969, 1970, and 1971 show ground disturbances in the area which may reflect the reported lithium destruction activities (DOE, 1992).

Table 2.6 was revised based on comments received from the CDPHE on the Annual Update for the Historical Release Report dated September 1998 (CDPHE, 1999). It should be noted that all analytical results available for IHSS 140 have not been evaluated with the current soil action levels (revised in 1999 update to RFCA). Only those compounds identified in Table 2.6 have been evaluated in relation to the current soil action levels.

#### References

CDPHE, 1999, Correspondence referencing Annual Update to the Historical Release Report (September 1998) July

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August

DOE, 1995, *Phase II RFI/RI Report 903 Pad, Mound, and East Trenches Area Operable Unit No. 2*, RF/ER-95-0079 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO, May

DOE, 1996a, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 1996b, *Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5*, RF/ER-95-012 UN, Rev 0 Rocky Flats Environmental Technology Site, Golden, CO, April

RMRS, 1997, *Sampling and Analysis Plan for the 903 Drum Storage Area (IHSS 112), Lip Area (IHSS 155) and Americium Zone*, RF/RMRS-97-084 Rocky Mountain Remediation Services, Rocky Flats Environmental Technology Site, Golden, CO, July.

KH, 2000, *Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Rev 1 RF/RMRS 99-427 UN* Kaiser-Hill, Rocky Flats Environmental Technology Site, Golden, CO, July

**REFERENCE NUMBER: 900-155**

IHSS Reference Number 155, Buffer Zone Operable Unit

Unit Name 903 Lip Area

Approximate Location N749,000; E2,086,000

Date(s) of Operation or Occurrence

Approximately 1964 - 1973

Description of Operation or Occurrence

Surface soils to the east and southeast of the 903 Pad Drum Storage Area (PAC 900-112) exhibit elevated Plutonium ( $\text{Pu}^{239/240}$ ) and Americium ( $\text{Am}^{241}$ ) activities. The contamination is primarily attributed to storm and wind dispersion from the 903 Pad Drum Storage Area with possible contributions from historical fires and stack effluent (DOE, 1992). Areas with elevated  $\text{Pu}^{239/240}$  and  $\text{Am}^{241}$  activities (above background) east and southeast of the 903 Lip Area are referred to as the Americium Zone. Spatial configurations of  $\text{Am}^{241}$  and  $\text{Pu}^{239/240}$  contamination are associated because  $\text{Am}^{241}$  is a daughter product of plutonium decay. Historical uses of the 903 Pad (PAC 900-112) are described in detail in the HRR, (DOE, 1992). Soil southeast of the 903 Pad was primarily impacted due to the prevailing wind direction and topography. Drum removal activities, grading, and construction of the asphalt pad over PAC 900-112 was completed in 1969. By 1971, areas of the 903 Lip Area (PAC 900-155) surrounding the 903 Pad were graded with fill dirt placed over a wide area. Fill materials associated with the two areas are suspected to be contaminated as well (DOE, 1995 and RMRS, 1997).

Physical/Chemical Description of Constituents Released

An estimated 16 grams of  $\text{Pu}^{239/240}$  were distributed by wind and surface water runoff in a 2000-acre area predominantly to the east and southeast of the 903 Pad. Prior to the installation of the asphalt pad on the 903 Drum Storage Area, it was estimated that 1.2 million  $\text{ft}^2$  of soil was contaminated to levels above 500 dpm/g (DOE, 1992).

Responses to Operation or Occurrence

Monitoring of the soil around the 903 Drum Storage Area has occurred periodically since 1958. Ground surveys for alpha detection were performed in 1964 and revealed contamination in the soil south and east of the 903 Drum Storage Area (DOE, 1992).

From 1968 through 1971, some of the radiologically contaminated material was removed, the surrounding area was re-graded and covered by an imported base material and an asphalt cap. However, during drum removal and remedial activities, wind and rain spread plutonium-

contaminated soils to the east and southeast from the 903 Drum Storage Area resulting in IHSS 155 (903 Lip Area). Several limited excavations have removed some of the plutonium-contaminated soils from the 903 Lip Area, however, results from the OU 2 Phase II RFI/RI sampling and analysis confirm that radiologically contaminated soils remain (DOE, 1995, RMRS, 1997)

In 1969, the area outside the storage area fence was graded and rocks and soil from this area were moved into the storage area in preparation for the asphalt pad construction. In 1970, four inches of fill were placed on a 500 by 600 ft area to the east and south of the 903 Drum Storage Area.

In 1973, an aerial radiological survey indicated radionuclide activities in the 903 Lip Area that were higher than previously detected. The results were confirmed by additional surveys. Based on these results, it was estimated that approximately 2,000 square meters of soil would be removed to a depth of 15-cm by hand shoveling into 55-gallon drums. The excavated soil was replaced with clean topsoil. Efforts were taken to stabilize and re-vegetate the soil. In 1976, thirty-five 4-ft by 4-ft by 7-ft crates (approximately 4,000 ft<sup>3</sup>) of soil were removed from a highly contaminated hot spot within the 903 Lip Area. Removal of soil took place in a portable building equipped with a high efficiency particulate air (HEPA) filter. This method was considered safe but inefficient in comparing time consumption to the amount of contaminated soil requiring removal (Barker, 1982).

Soil removal activities were conducted again from June 28, 1978 through October 13, 1978. Heavy equipment was used to move the soil. Weekly reports from the Environmental Analysis and Control group detail the soil removal activities. Soil with contamination levels in excess of 2,000 cpm by FIDLER were removed. The area excavated was estimated to be 43,000 ft<sup>2</sup> to a depth of approximately 9 inches. The soil was packaged and shipped to the Nevada Test Site (NTS). In 1978, 1,448 waste crates were removed and shipped off-Site (Barker, 1982).

Numerous soil surveys were performed to characterize the radioactive contamination from the 903 Drum Storage Area (DOE, 1995, RMRS, 1997). Most or all of the re-suspended airborne contamination was attributed to vehicular traffic on the East Perimeter Road. High volume air samplers were installed east and southeast of the 903 Lip Area. Because of the close proximity to the 903 Drum Storage Area and the 903 Lip Area, the area of the East Perimeter Road with the highest levels of airborne contamination was remediated in 1984 to reduce contaminant re-suspension (Setlock, 1984).

#### Fate of Constituents Released to Environment

Several investigations have been conducted on the 903 Lip Area and Americium Zone to evaluate the extent of contamination. The data collected have been reported in the OU, No. 2 Phase II, RFI/RI Report (DOE, 1995). In addition, the Final Sampling and Analysis Plan for the Site Characterization of the 903 Drum Storage Area (IHSS 112), 903 Lip Area (IHSS 155), and Americium Zone (RMRS, 1998) was implemented in 1998 and 1999 to further characterize and define the volume of soils exceeding RFCA Tier I and Tier II Action Levels and for VOCs exceeding Tier I Soil Action Levels (DOE, 1996).

The most comprehensive investigation of soil contamination at the 903 Lip Area was conducted during the implementation of the Final Sampling and Analysis Plan for the Site Characterization of the 903 Drum Storage Area (IHSS 112), 903 Lip Area (IHSS 155), and Americium Zone (RMRS, 1998). The characterization effort included the completion of 37 boreholes in the 903 Lip Area for the radiological contamination assessment. A total of 1,110 radiological measurements were collected in the 903 Lip area and Americium Zone to characterize undisturbed surface soils.

#### *Surface and Subsurface Soils*

Results of surface and subsurface soil samples collected for this investigation are provided in the *Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone* (DOE, 2000). The results were compared to RFCA (DOE, 1996) RSALs for open space and revealed that approximately 1.8 acres exceed Tier I action levels. The majority of this area (1.7 acres) is located in the 903 Lip Area and approximately 1/8-acre is located in the Americium Zone. Approximately 14.5 acres exceed Tier II RSALs, 5.4 acres in the 903 Lip Area and 9.1 acres in the Americium Zone. Figures 2.12 and 2.13 (see IHSS 900-112) provide the extent of soil contamination in excess of Tier I and II RSALs for open space.

The area exceeding the Tier II action level is represented as the area where the sum of the radiation doses of americium-241, plutonium-239/240, uranium-234, -235, and -238 equals 15 millirem based on a hypothetical future resident scenario. The IHSS 155 boundary has been revised (See Appendix 4, Plate 1) based on these new data and is presented in Figure 2.15. The boundary is delineated based upon the Tier II RSAL exceedances.

The area estimates for soils exceeding Tier II action levels generated from the 903 Pad characterization study (17.04 acres) corresponds fairly well with estimates provided by the Actinide Migration Evaluation (AME) Study's Soil Erosion and Sediment Transport Model project (18.4 acres). The AME study generated the Plutonium 239/240 Distribution in Surface Soils (1999 Kriging Analysis) map. The map is presented in the Appendix B, Kriging Analysis and GIS/Actinide Transport Methodologies, of the Report on Soil Erosion/Surface Sediment

Transport Model for the Actinide Migration Evaluation at the Rocky Flats Environmental Technology Site (DOE, 2000) The map was generated by kriging plutonium-239/240 analytical results obtained from surface soil samples collected over the entire Site The Tier II soil exceedance area was determined by evaluating the area of soils exceeding a 115-pCi/g plutonium-239/240 activity

#### Action/No Further Action Recommendation

As discussed above, the site characterization of IHSS 155 has been completed Tier I exceedances in surface soil requires an action as discussed in action level framework (ALF) of RFCA An IM/IRA decision document will be initiated to address soils in the 903 Lip Area and Americium Zone, as well as the 903 Pad in 2002

#### Comments

IHSS 155 overlaps IHSS 140 and extends into the Americium Zone

#### References

Barker, C J , 1982, *Removal of Plutonium-Contaminated Soil from the 903 Lip Area During 1976 and 1978*, RFP-3226, January 25, 1982, Rockwell International, Rocky Flats Plant, Golden, CO

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Final Phase II RFI/RI Report, 903 Pad, Mound, East Trenches Area, Operable Unit No 2*, RF/ER-95-0079 UN, U S Department of Energy, Rocky Flats Plant, Golden, CO

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rock Flats Environmental Technology Site, Golden, CO

DOE, 1997, *Summary of Existing Data on Actinide Migration at the Rocky Flats Environmental Site*, RF/RMRS-97-074 UN, US Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2000, *Characterization Report for the 903 Drum Storage Area, 903 Lip Area and Americium Zone*, RF/RMRS-99-427 UN, Rocky Flats Environmental Technology Site, Golden, CO June

RMRS, 1997, *903 Drum Storage Area, 903 Lip Area and Americium Zone Data Summary*, RF/RMRS-97-086-UN, Rocky Flats Environmental Technology Site, Golden, CO, September

RMRS, 1998, *Sampling and Analysis Plan for the Site Characterization of the 903 Drum Storage Area, 903 Lip Area and Americium Zone*, RF/RMRS-97-084, Rev 1, Rocky Flats Environmental Technology Site, Golden, CO, August

Setlock, G , 1984, Memorandum to G W Campbell, Rockwell International entitled "Environmental Analysis and Control Highlights for Week ending November 16, 1984", Rockwell International, Rocky Flats Plant, Golden, CO

**PAC REFERENCE NUMBER: 900-183**

IHSS Reference Number 183, Buffer Zone Operable Unit

Unit Name Gas Detoxification Area

Approximate Location N748,500, E2,086,000

Date(s) of Operation or Occurrence

Approximately 1963 - Approximately 1983

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

Building 952 was constructed in 1963 as a Toxic Gas Storage building where it was managed by the Industrial Hygiene group. Beginning in approximately January 1967, bottles containing hazardous gases were transported by the Rocky Flats Fire Department from various buildings to Building 952 for storage. Typically, shipments consisted of one or two lecture-size gas bottles. Gases were stored for up to five years prior to disposal. Selected gases were detoxified at the site. The method of detoxification was selected based on the characteristics of the material. Others were packed and shipped to off-site vendors for disposal (DOE, 1992). There are no reports of a release to the surrounding soils having occurred from the storage of this material.

Physical/Chemical Description of Constituents Released

No documentation was found which detailed any releases to the building or surrounding soils resulting from this practice (DOE, 1992).

Responses to Operation or Occurrence

Selected gases were detoxified using various commercial neutralization processes available at the time. Neutralization processes included reaction with water, acid, caustic, carbon, or air. Byproducts were disposed of as process wastes. Upon completion of the neutralization process for each type of gas, the glassware used in the process was triple rinsed, crushed, and deposited in the Present Landfill (DOE, 1992).

Fate of Constituents Released to Environment

No documentation was found which detailed any release from IHSS 183 (PAC 900-183) (DOE, 1992). This IHSS was studied as part of Operable Unit 2 (DOE, 1995). As presented in the HRR and supporting reference material, past releases from IHSS 183 (PAC 900-183) are not known to have occurred (DOE, 1992). The reference material, which included records on the movement, storage and disposal of toxic gases, Industrial Hygiene status reports, and the RCRA 3004U

93

waste management report, were re-evaluated to support the assertion that a release at IHSS 183 has not occurred (DOE, 1992). IHSS 183 was investigated as part of the OU2 RFI/RI and, for investigative purposes, was grouped with IHSS 140 (PAC 900-140) because of the close proximity of these two IHSSs. Of the nine boreholes located within IHSS 140, one borehole (12791) was located near IHSS 183. Samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, metals and radionuclides. Only methylene chloride (2 ppb) and acetone (15 ppb) were detected in borehole 12791. These chemicals were not retained in the OU2 RFI/RI or the associated human health risk assessment as chemicals of concern, DOE 1995). With respect to ecologic receptors, IHSS 183 was not identified as a source area in the Ecological Risk Assessment for the Woman Creek Watershed (DOE, 1996).

#### Action/No Further Action Recommendation

IHSS 183 is proposed for NFA at this time for the following reasons: 1) there is no evidence or knowledge of a release to the surrounding soils at this location, 2) no current source of contamination can be identified, 3) the DOE submitted RCRA clean closure certification for RCRA Unit 23 in March 1996 (see attached), and 4) recommendation for NFA at this site is consistent with the criteria for recommending No Further Action decisions presented in RFCA, Attachment 6, RCRA Guidance (DOE, 1996).

#### Comments

It is recognized that IHSS 183 (PAC 900-183) overlaps with IHSS 155 which will be addressed as a separate action.

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000).

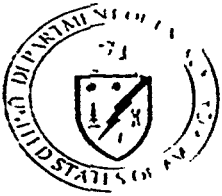
#### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June.

DOE, 1995, *Final Phase I RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit 2*, RF/ER-95-0079 UN, Rocky Flats Environmental Technology Site, Golden, CO, October.

DOE, 1996, *Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5*, RF/ER-96-0012 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO, April.

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August.



Department of Energy

ROCKY FLATS FIELD OFFICE  
P O BOX 928  
GOLDEN COLORADO 80402-0928

MAR 11 1996

96-DOE-07436

Mr Joe Schieffelin, Unit Leader  
Hazardous Waste Control Program  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

Dear Mr Schieffelin

The United States Department of Energy, Rocky Flats Field Office (DOE, RFFO) is submitting the enclosed Resource Recovery and Conservation Act (RCRA) closure certification for RCRA Unit 23. The Part A Permit Application and the Site's Part B Operating Permit (RCRA Permit) describes Unit 23, Gas Cylinder Storage, Building 952. The Site's Part B Operating Permit, specifically Part VIII (A)(5)(h) and (A)(7)(6)(2)(vii) establishes the permit condition for the enclosed Closure Certification. This clean closure certification is based on a visual inspection of the premises by Site personnel and an independent Professional Engineer registered within the State of Colorado. There is no evidence to suggest that any releases or spills of hazardous waste or constituents have ever occurred in Unit 23; therefore, with this final documentation, RCRA Unit 23 is clean closed.

This letter also serves as a Class 1 Permit Modification to remove Unit 23 from the RCRA Permit. The reference to Unit 23 is hereby removed from the Table of Contents, the Part A Permit Application, and Part III Unit Specific Conditions in the RCRA Permit. In addition, Paragraph A.5.h pertaining to Unit 23 is removed from Part VIII of the RCRA Permit. These changes are effective as of the date of this letter. The changes are administrative in nature and are therefore, submitted as a Class 1 Permit Modification pursuant to Appendix 1 to 6 CCR 1007-3, §100.63.

If you have any questions regarding this matter, please contact Mr David Maxwell, of my staff, at 966-4017.

Sincerely,



Keith Klein  
Deputy Manager

Enclosure

cc w/o enc  
C Gilbreath, CDPHE, RFFO  
D Grosek, EAG, RFFO  
D Maxwell, ELG, RFFO  
G Uchicht, CAI  
K North, K-II

95

**RCRA Closure Certification**  
for  
**RCRA Unit 23**

**Rocky Flats Environmental Technology Site**  
**Golden, Colorado 80402-0464**

**Prepared by**  
**Rocky Mountain Remediation Services**

**January 1996**

96

# Closure Certification - RCRA Unit 23

---

## 1.0 Introduction

The purpose of this report is to certify the closure of Resource Conservation and Recovery Act (RCRA) Unit 23 (Building 952, Gas Cylinder Storage) at the Rocky Flats Environmental Technology Site (RFETS). ERM-Rocky Mountain, Inc. (ERM) has been retained as an independent third party by Rocky Mountain Remediation Services to perform this certification. This report provides the data to support the closure determination by the owner/operator of a facility and an independent, registered Professional Engineer, as required by 6 Colorado Code of Regulations (CCR) 1007-3, Part 264. The data required for closure determination of Unit 23 is included in this report.

This closure of RCRA Unit 23 was performed in accordance with applicable Colorado Hazardous Waste Act (CHWA) regulations for RCRA permitted units as defined within 6 CCR 1007-3 Section 264, and the RFETS RCRA Part B Permit, Section VIII, "Closure of Permitted Units."

### 1.1 Project Description

RCRA Unit 23 (Building 952) is constructed of a 4-inch concrete slab floor and corrugated steel roof and walls. The concrete floor has an epoxy painted surface. The building is located east of the 881 Hillside. Unit 23 was identified as a permitted hazardous waste management unit regulated by RCRA; thus Unit 23 was permitted for storing nonradioactive hazardous waste in gas cylinders and lecture bottles.

### 1.2 Historical Overview

RCRA Unit 23 stored a total of 19 gas lecture bottles (approximately 2 inches in diameter and 12 inches long) between April 1988 and December 1994. All the lecture bottles had an accumulation start date of April 21, 1988. The bottles were anchored to steel racks and stored upright on the concrete floor.

A private subcontractor, Emergency Technology Services Corporation (ETSC), was hired in the summer of 1992 to inspect the condition of the cylinders and valves to ensure they were in a safe configuration and that the integrity of the cylinders had not been compromised. ETSC found no anomalous conditions with respect to the gas cylinders or their storage. Based on process knowledge and the weekly RCRA inspections, documentation exists to confirm the fact that there was never a release, spill, or breach from the cylinders while they were managed in RCRA Unit 23. The last lecture bottles containing hazardous waste were shipped off site for disposal on December 21, 1994. There has been no storage of hazardous waste in the unit since then.

The closure plan in the permit for RCRA Unit 23 does not require soil or surface rinse sampling due to the nature of the hazardous waste that was stored in the unit (expired or excess compressed gas cylinders). Documentation of clean closure is based on a visual inspection of the premises and a review of the applicable documentation by an independent Professional Engineer, registered within the State of Colorado.

97

## **Closure Certification - RCRA Unit 23**

---

### **2.0 RCRA Closure Certification Activities**

The following activities were performed by ERM and RMRS personnel to certify the closure of RCRA Unit 23.

A review of the inspection records and other pertinent documentation was conducted on December 21, 1995. Weekly inspections commenced in May 1988 and continued through November 1995. The following information is recorded with respect to this record inspection.

- Inspection records were thorough and complete and presented no evidence of spills or leaks from the hazardous waste containing cylinders that were stored in the unit.
- All cylinders were evaluated and leak tested, as applicable, in January 1992. All cylinders passed inspection, confirming the integrity of the cylinders.
- Secondary containment pans were installed in June 1992.
- Pictures of the bottles were taken in February 1993. A review of these pictures shows no evidence that the physical integrity of any of the cylinders had been compromised.
- Inspection records also indicate that a roof leak occurred in March 1994. The roof was immediately repaired; all subsequent RCRA inspections indicate no further evidence of moisture present in the unit.
- Cylinder C00015 was water-dip tested by EnviroCheck, Inc. on November 16, 1994. The cylinder passed the test with no evidence of leakage from the cylinder.
- All cylinders were shipped off site during the week of December 13, 1994, with the last shipment occurring on December 21, 1994.

A physical inspection of Unit 23 was also conducted on December 21, 1995. The following information is recorded with respect to the inspection of this unit.

- The unit was in good condition. Some minor rust staining from the wall fasteners was noted. There was no excessive corrosion or deterioration of the structural or fabricated steel.
- The concrete floor was in good condition, showing no signs of excessive deterioration. The unit floor had been sealed with gray epoxy paint; however there were some very small superficial cracks in the floor.
- All floor and roof vents were in good condition, with no visible obstructions or corrosion observed.
- The exterior of the unit is in good condition. There are no signs of unusual corrosion or degradation of the building.
- There was no evidence of spills or leaks around the outside of the unit.

98

## Closure Certification - RCRA Unit 23

### 3.0 Conclusion and Closure Certification

The closure performance standards identified in the Part B RCRA permit for RCRA Unit 23 have been met based on the physical inspection of the unit and review of the applicable RCRA Unit 23 management records. Also, there is no record or physical evidence to suggest that leaks or spills ever occurred from any of the hazardous waste cylinders to the RCRA storage unit or surrounding area. In summary, there is no evidence to suggest that during any of the inspections, evaluations, or testing of the bottles, any cylinders had ever suffered an integrity breach. Therefore, RCRA Unit 23 is considered closed in accordance with 6 CCR 1007-3, Section 264.

The undersigned hereby certify that closure of the RCRA Unit 23 at the Rocky Flats Environmental Technology Site was performed in accordance with applicable regulations and the approved closure plan.



*Roland C. Hea* P.E.  
Professional Engineer  
Roland C. Hea  
ERM - Rocky Mountain, Inc.

1/30/96  
Date

**PAC REFERENCE NUMBER: 900-1311**

IHSS Number                      N/A

Unit Name                        Septic Tank East of Building 991

Approximate Location        N750199, E2,086,339

Date(s) of Operation or Occurrence

1952

Description of Operation or Occurrence  
(Original HRR, DOE, 1992)

A sewage-related structure existed east of Building 991 during 1952 (DOE, 1992). This structure is referred to in several documents by a variety of names including "temporary sewage disposal bed", "sewerage test area", septic tank and wooden septic tank (EG&G, 1994).

During an interview with Roy Tisdale, the carpenter believed to have been contracted for construction of a wooden septic tank, Mr. Tisdale recalled that the location of the structure was approximately 200-300 yards east of Building 991. Mr. Tisdale described a brownish, odorous liquid flowing from a roughly 4-inch diameter metal pipe into the wooden structure where the carpenters were working during construction of the tank. At that time, an RFETS employee made a reference to this liquid needing to be kept away from the creek and nearby cattle because it could "kill the cattle," therefore, Mr. Tisdale did not complete the project because he believed that his men were being exposed to a potentially dangerous liquid. Mr. Tisdale believed that the source of the liquid was the office buildings to the west (DOE, 1992).

Based on review of waste disposal documents during 1952, the fluid flowing into the temporary sewage disposal bed (or septic tank) is believed to have been sewage. On September 17 and 18, 1952, Paul Martin worked with Mr. Thompson of the Austin Company to install a mixing box and temporary chlorinator for the effluent of the septic tank (DOE, 1992). On September 17, the effluent from the waste disposal plant was sampled at two points: the flume coming out of the septic tank near Building 995 and the first pond just below the septic tank. Test results showed 11 ppm of dissolved oxygen. During these testing and observation activities, it was noted that the estimated 1-2 hour septic tank retention time joined with less than the five-hour retention time in the first pond below the septic tank was inadequate. Additionally, it was noted that a 12-hour retention time could be accomplished by putting in more ponds. On September 25, 26 and 29, 1952, visual effluent samples taken from the septic tank were clear with no odor (EG&G, 1994).

In a September 17, 1952, letter to F. H. Langell, A. L. DeWaele locates the sewerage test area to the east of Building 91 (now known as Building 991) between the limited area fence and the cattle fence. He reported a mild odor at the north side of the dam, which was approximately a quarter

mile from the outlet of the 991 area. He followed "the seepage from the dam about a hundred yards to Womans Creek then down the creek a few hundred yards." It is believed that this reference to "Womans Creek" was in error and was meant to refer to Walnut Creek or South Walnut Creek, which flows by the Building 991 Area. Woman Creek is located nearly 2,000 feet south of Building 991 (EG&G, 1994).

A September 17, 1952, letter from John Epp to F.H. Langell describes the effluent of the sewage disposal plant as discharging from a wooden flume by gravity into a ravine with a free-fall of roughly 2 feet at the rate of 5 gallons/minute. The effluent was described as clear, white and odorless. The ditch above the discharge was dry and the ditch below the discharge contained a considerable amount of green algae. No odor was noticed at the septic tank, discharge or ditch (EG&G, 1994).

Aerial photographs taken of RFETS in 1953 indicate a possible ground disturbance in the general area east of Building 991 as described by Mr. Tisdale and waste disposal documents, however, it should be noted that this photograph is of relatively poor quality (EG&G, 1994).

#### Physical/Chemical Description of Constituents Released

The influent to and effluent from the temporary waste disposal bed or septic tank is believed to have been sewage based on review of waste disposal documents during 1952. This sewage is expected to have had typical characteristics of sewage and is not expected to have been contaminated with radionuclides (EG&G, 1994).

#### Responses to Operation or Occurrence

No documentation was identified which noted the termination of usage or removal of the septic tank; however, the Building 995 activated sewage sludge treatment system may have replaced the use of this tank in 1953 (EG&G, 1994).

#### Fate of Constituents Released to Environment

A wooden flume is believed to have transported the sewage effluent from the waste disposal plant's septic tank to a ditch which discharged to a pond east of Building 991 before uncontrolled release of the effluent to South Walnut Creek. This pond on South Walnut Creek is still in existence and is known as Pond B-2. No additional documentation was identified which detailed the fate of constituents released to the environment (EG&G, 1994).

During preparation of the SAP for Characterization of Potential No Further Action Sites (RMRS, 1999), it became apparent that the location of PAC 900-1311 as identified in the HRR Seventh Quarterly Update (EG&G, 1994) is not accurate. Based upon the original PAC description and as described above, the flume was located across South Walnut Creek and up-gradient by several hundred feet. This location is not consistent or logical with the original description. Based upon this finding, PAC 900-1311 has been relocated to its probable location (see Figure 2.16).

Though the exact location cannot be positively identified, the area chosen for sampling lies within a topographical low. This may have been the actual location of the flume, but if not, the selected area will show any elevated contamination as all surficial contamination would migrate through this area before leaving the topographic depression through a culvert (RMRS, 1999a)

Sampling to support characterization of PAC 900-1311 for possible designation as NFA was conducted per the Regulatory Agency approved SAP for Characterization of Potential No Further Action Sites (RMRS, 1999a). Surface samples were collected from a depth of zero to six inches and analyzed for SVOCs, pesticides/PCBs, metals and isotopic radionuclides (Figure 2.16). Shallow subsurface composite samples were also collected from a depth of six inches to a depth of two feet to evaluate the potential vertical distribution of these contaminants. Results of the analyses are summarized in Tables 2.7 and 2.8 along with the appropriate RFCA action level. A correlation table (Table 2.9) is provided for future reference to match the RIN#, the site location, Borehole ID, event, depth and analysis performed. All of the analytical results are presented in the Draft No Further Action Justification Document for Incorporation into the Historical Release Report (HRR) for PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313 (RMRS, 1999b).

As indicated in Tables 2.7 and 2.8, concentrations for the PCOCs identified at PAC 900-1311 were not detected at levels exceeding RFCA action levels. For those PCOCs without a corresponding action level, the EPA Region 3 risk-based concentration table was reviewed. Of those contaminants (carbazole, 2-methylnaphthalene, and benzo(g,h,i)perylene), carbazole had a risk-based concentration of  $2.9E+02$  mg/Kg. The concentration detected was below the risk-based concentration.

#### Action/No Further Action Recommendation

Laboratory results for surface soil samples collected at PAC 900-1311 are presented in this Annual Update to the HRR. These results were used to support an NFA determination for this PAC in the Annual Update for the Historical Release Report for 1999 as well (RMRS, 1999c). The laboratory results for four semivolatile organic compounds, carbazole, 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene, are qualified as estimated values, less than the detection limit ("J"). Site personnel researched the availability of risk data for carbazole, 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene in the EPA Integrated Risk Information System (IRIS). Although information was present for benzo(g,h,i)perylene and phenanthrene, no risk factors are available. IRIS did not contain any information for carbazole and 2-methylnaphthalene. Therefore, Preliminary Programmatic Remediation Goals (PPRGs) cannot be calculated for these organic compounds.

**Table 2.7 Summary of Surface Soil Sample Results for PAC 900-1311**

Potential Contaminants Of Concern <sup>1</sup>	Number of Surface Soil Samples	Number of Detects > Proposed RFCA Tier II	Comparison Values <sup>2</sup> (mg/Kg or pCi/g)		Range of Values Detected (mg/Kg or pCi/g)	
			Proposed RFCA Tier II <sup>3,4</sup>	Proposed RFCA Tier I <sup>5,6</sup>		
Volatile Organic Compounds			MinimumMaximum			
Toluene	4 (+1 duplicate)	0	4 09E+05	4 09E+05	Not detected	0 002J
Semivolatile Organic Compounds						
Acenaphthene	4 (+1 duplicate)	0	1 23E+05	1 23E+05	0 033J	0 040J
Fluorene	4 (+1 duplicate)	0	8 18E+04	8 18E+04	0 022J	0 027J
Phenanthrene	4 (+1 duplicate)	0	--	--	0 170J	0 380J
Anthracene	4 (+1 duplicate)	0	6 13E+05	6 13E+05	0 032J	0 061J
Carbazole	4 (+1 duplicate)	0	--	--	0 031J	0 043J
Fluoranthene	4 (+1 duplicate)	0	8 18E+04	8 18E+04	0 450	0 690
Pyrene	4 (+1 duplicate)	0	6 13E+04	6 13E+04	0 260J	0 640
Benzo(a)anthracene	4 (+1 duplicate)	0	7 84E+00	7 84E+02	0 100J	0 260J
Chrysene	4 (+1 duplicate)	0	7 84E+02	7 84E+04	0 130J	0 350J
Bis(2-ethylhexyl)phthalate	4 (+1 duplicate)	0	4 09E+02	4 09E+04	0 029J	0 040J
Benzo(b)fluoranthene	4 (+1 duplicate)	0	7 84E+00	7 84E+02	0 094J	0 0280J
Benzo(k)fluoranthene	4 (+1 duplicate)	0	7 84E+01	7 84E+03	0 110J	0 300J
Benzo(a)pyrene	4 (+1 duplicate)	0	7 84E-01	7 84E+01	0 120J	0 310J
Indeno(1,2,3-cd)pyrene	4 (+1 duplicate)	0	7 84E+00	7 84E+02	0 078J	0 200J
Dibenzo(a,h)anthracene	4 (+1 duplicate)	0	7 84E-01	7 84E+01	0 052J	0 110J
Benzo(g,h,i)perylene	4 (+1 duplicate)	0	--	--	0 082J	0 220J
Pesticides/PCBs						
None detected	4 (+1 duplicate)	0	NA	NA	NA	NA
Total Metals						
Silver	4 (+duplicate)	0	1 02E+04	1 02E+04	0 43	2 0
Copper	4 (+duplicate)	0	7 56E+04	7 56E+04	14 7	20 9
Zinc	4 (+duplicate)	0	6 13E+05	6 13E+05	99	167
Radionuclides						
Americium-241	4 (+duplicate)	0	38	215	334	1 63
Plutonium-239/241	4 (+duplicate)	0	252	1429	219	879
Uranium-235	4 (+duplicate)	0	24	135	- 007	075

1 Contaminants of concern are chemicals detected above background concentrations presented in the Geochemical Characterization of Background Surface Soils, Background Soils Characterization Program (DOE, 1995)

2 PAC 900-1311 is within the Industrial Area OU, Industrial Use RFCA Action Levels apply

3 Tier II values for non-radionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

4 Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident.

5 Tier I values for non-radionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

6 Tier I values for radionuclides are based on an annual dose limit of 15 mrem to an office worker

**Table 2.8 Summary of Subsurface Soil Sample Results for PAC 900-1311**

Potential Contaminants Of Concern <sup>1</sup>	Number of Sub- Surface Soil Samples	Number of Detects > RFCA Tier II	Comparison Values <sup>2</sup> (mg/Kg or pCi/g)		Range of Values Detected (mg/Kg or pCi/g)	
			RFCA Tier II <sup>3,4</sup>	RFCA Tier I <sup>5,6</sup>		
<b>Volatile Organic Compounds</b>					<b>Minimum</b>	<b>Maximum</b>
Cis-1,2-dichloroethene	4	0	1 4E-01	1 4E+01	0 001J	0 008
Toluene	4	0	7 07E+00	7 07E+02	Not detected	0 002J
<b>Semivolatile Organic Compounds</b>						
Naphthalene	4	0	1 01E+02	1 01E+04	0 024J	0 061J
2-Methylnaphthalene	4	0	--	--	Not detected	0 024J
Acenaphthene	4	0	5 34E+02	5 34E+04	0 041J	0 150J
Fluorene	4	0	6 94E+02	6 94E+04	0 030J	0 120J
Phenanthrene	4	0	--	--	0 240J	0 880
Anthracene	4	0	1 12E+04	>1E+06	0 057J	0 180J
Carbazole	4	0	--	--	0 022J	0 091J
Fluoranthene	4	0	5 37E+03	5 37E+05	0 240J	1 10
Pyrene	4	0	3 97E+03	3 97E+05	0 230J	1 10
Benzo(a)anthracene	4	0	1 60E+00	1 60E+02	0 087J	0 440
Chrysene	4	0	1 60E+02	1 60E+04	0 026J	0 540
Bis(2-ethylhexyl)phthalate	4	0	3 11E+03	3 11E+05	0 026J	0 120J
Benzo(b)fluoranthene	4	0	4 95E+00	4 95E+02	0 057J	0 430
Benzo(k)fluoranthene	4	0	4 95E+01	4 95E+03	0 076J	0 470
Benzo(a)pyrene	4	0	7 01E+00	7 01E+02	0 077J	0 490
Indeno(1,2,3-cd)pyrene	4	0	1 40E+01	1 40E+03	0 042J	0 330J
Dibenzo(a,h)anthracene	4	0	1 53E+00	1 53E+02	0 048J	0 110J
Benzo(g,h,i)perylene	4	0	--	--	0 046J	0 340J
<b>Pesticides/PCBs</b>						
None detected	4	0	NA	NA	NA	NA
<b>Total Metals</b>						
None detected above background	4	0	NA	NA	NA	NA
<b>Radionuclides</b>						
Americium-241	4	0	38	215	0 228	7 02
Plutonium-239/241	4	0	252	1429	0 929	8 34
Uranium-235	4	0	24	135	-0 017	0 151

<sup>1</sup> Contaminants of concern are those chemicals detected above background concentrations presented in the Background Geochemical Characterization Report (EG&G, 1993)

<sup>2</sup> PAC 900-1311 is within the Industrial Area OU, Industrial Use RFCA Action Levels apply

<sup>3</sup> Tier II values for non-radionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

<sup>4</sup> Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident

<sup>5</sup> Tier I values for non-radionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for non-carcinogenic toxicity

<sup>6</sup> Tier I values for radionuclides are based on an annual dose limit of 15 mrem to an office worker

105

**Table 2.9 Correlation Table for Characterization Samples at PAC 900-1311**

RIN No	PAC	Borehole ID	Event No	Bottle No	Actual Sample Interval (Inches BGS)	Analysis	Comments
			Borehole No	#1 #2 #3 #4	Borehole No	#1 #2 #3 #4	
99A7763	900-1311	4 Real	001 006 011 016	001	0-6 0-5 0-5 0-4	SVOCs	Soil/Sed
				001	0-6 0-5 0-5 0-4	PCBs	Soil/Sed
				001	0-6 0-5 0-5 0-4	Metals	Soil/Sed
				002	0-6 0-5 0-5 0-4	ISOs	Soil/Sed
				003	0-6 0-5 0-5 0-4	Rad Screen	Soil/Sed
			002 007 012 017	001	6-8 5-9 5-8 4-7	VOC Grab	Soil/Sed
			003 008 013 018	001	8-24 8-24 8-13 7-13	SVOCs	Soil/Sed
				001	8-24 8-24 8-13 7-13	PCBs	Soil/Sed
				001	8-24 8-24 8-13 7-13	Metals	Soil/Sed
				002	8-24 8-24 8-13 7-13	ISOs	Soil/Sed
			005 010 015 020	001	24-28 19-21 13-17 13-16	VOC Grab	Soil/Sed
		Borehole #3 DUPLICATE	021	001	0-5	SVOCs Dup	Soil/Sed
				001	0-5	PCBs Dup	Soil/Sed
				001	0-5	Metals Dup	Soil/Sed
				002	0-5	ISOs Dup	Soil/Sed
			022	001	5-8	VOC Dup	Soil/Sed
		Equipment Rinsate	023	001-003	n/a	VOA 8260	Aqueous
				004-005	n/a	SVOA 8270	Aqueous
				006	n/a	PCBs 8081	Aqueous
				007	n/a	Metals SW846	Aqueous
				008	n/a	ISOs	Aqueous

In addition, carbazole and phenanthrene (a constituent of coal tar pitch) are generated during the processing of coal tars and are commonly found in roadway construction materials

The analytical results for these compounds were "estimated" below the detection limit, are not considered to be a hazard and do not influence the evaluation of this PAC for the NFA determination. Based on the results of the soil samples collected, a contaminant source was not identified therefore, in accordance with RFCA (DOE, 1996), PAC 900-1311 is recommended for No Further Action

#### Comments

PAC 900-1311 was originally proposed for NFA in the 1999 Annual Update to the HRR (RMRS, 1999c)

In response to comments received from the Regulatory Agencies on June 23, 2000, further research was conducted for PAC 900-1311. The new information presented herein is considered justification for re-submitting the proposed NFA determination in this Annual Update to the HRR.

106

## References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, 1995, *Geochemical Characterization of Background Surface Soils Background Soils Characterization Program*, Rocky Flats Environmental Technology Site, Golden, CO, May

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Rocky Flats Environmental Technology Site, Golden, CO

EG&G, 1993, *Background Geochemical Report*, Rocky Flats Environmental Technology Site, Golden, CO, September

EG&G, 1994, *Historical Release Report, Seventh Quarterly Update, January 1, 1994 to March 31, 1994*

EPA, 1999, EPA Region III Risk-based Concentration Table, April

RMRS, 1999a, *Sampling and Analysis Plan for Characterization of Potential No Further Action Sites*, RF/RMRS-99-339, Rocky Flats Environmental Technology Site, Golden, CO, June

RMRS, 1999b, *Draft No Further Action Justification Document for Incorporation into the Historical Release Report (HRR) PACs NW-1501, NE-1408, NE-1409, 900-1309, 900-1311, 900-1312, 900-1313*, Rocky Flats Environmental Technology Site, Golden, CO, July

RMRS, 1999c, *Annual Update to the Historical Release Report, RF/RMRS-99-428 UN*, Rocky Flats Environmental Technology Site, Golden, CO, September.

**PAC REFERENCE NUMBER: 900-1318**

IHSS Reference Number Not Applicable

Unit Name Release of F001 Listed Waste Water to Soil

Occurrence Report # RFO-KHLL-ENVOPS-1996-0011

Approximate Location N749,995, E2,086,231

Date(s) of Operation or Occurrence

October 7, 1996

Description of Operation or Occurrence

On October 7, 1996 at approximately 10 00 a m., workers discovered a small amount of water leaking from a level-indicating valve associated with the SW-59 collection tank. The valve was positioned on the north side of the tank and the estimated volume of water (which contained F001 listed RCRA constituents) reaching the soil was approximately one pint. The fitting was tightened immediately which stopped the leak and the area was monitored for VOCs during remediation of the soil (DOE, 1996)

Physical/Chemical Description of Constituents Released

Historical characterization of the SW-59 seep water shows elevated levels of VOCs. Contaminants identified in the SW-59 Collection Seep are as follows:

<u>Compound</u>	<u>Station</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU2 ARAR</u>
Carbon Tetrachloride	SW-59	40	ug/L	5
Chloroform	SW-59	8	ug/L	1
Tetrachloroethene	SW-59	18	ug/L	1
Trichloroethene	SW-59	26	ug/L	5

Response to Operation or Occurrence

Upon discovery of the water leaking from the level-indicating valve, workers tightened a fitting which immediately stopped the leak. The spill area was contained after the area was monitored for VOCs. Approximately one 55-gallon drum of soil was removed and transported to a RCRA Hazardous Waste Management Unit (RCRA Unit No.18 03) after radiological screening was performed. Cleanup verification samples were collected to verify that the site was cleaned up and a RCRA Contingency Plan Implementation Report (CPIR) was filed (DOE, 1996). The CPIR Report 1996-0011 is provided as an attachment for reference to this PAC Narrative.

### Fate of Constituents Released to the Environment

Approximately one 55-gallon drum of soil and rock potentially contaminated with EPA Waste Code F001 was removed and transported to a RCRA Hazardous Waste Management Unit. No radiological contamination was found in the area of the release. Analytical data later confirmed that the potentially contaminated soil had been removed (see attached CPIR).

The location where the spill occurred was physically removed during the installation of the Mound Plume Treatment System collection trench in 1997.

### Action/No Further Action Recommendation

This PAC does not warrant further investigation due to the small amount of material released to the environment, the immediate remedial response, and the cleanup verification samples showing that the release was adequately cleaned up, a current or potential source of contamination does not exist. PAC 900-1318 is therefore proposed for NFA consistent with RFCA guidance.

### Comments

This PAC was inadvertently numbered as 900-1307 in the 1997 Annual Update and proposed as NFA (DOE, 1997). The PAC Reference Number has been corrected as PAC 900-1318.

The minimal release was directly attributable to a 24-hour tank and pipe inspection conducted at the facility. The incident did not result in any injury or potential hazard to human health or the environment.

Radiological screening (rad screens) were performed onsite prior to VOC sample shipment. Isotopic analysis was not performed based upon historical characterization data of the seep (SW-59).

In response to comments received from the Regulatory Agencies on July 9, 1999, this PAC narrative update was submitted as part of an Interim Update to the HRR in August, 2000 (KH, 2000).

### References

DOE, 1996, *Occurrence Report (RFO-KHLL-ENVOPS-1996-0011)*, Rocky Flats Environmental Technology Site, Golden, CO, October.

DOE, 1997, *Annual Update for the Historical Release Report*, RF/RMRS-97-073.UN, Rocky Flats Environmental Technology Site, Golden, CO, September.

KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Rocky Flats Environmental Technology Site, Golden, CO, August.

RMRS, 1997, *Consolidated Water Treatment Facility Quarterly Operating Report, Fourth Quarter*, Rocky Flats Environmental Technology Site, Golden, CO, January

RMRS, 1997, *Environmental Operations CERCLA History Files*, Rocky Flats Environmental Technology Site, Golden, CO, July

OCCURRENCE REPORT

Environmental Management

(Name of Facility)

Function-of-Plant

(Facility Function)

Kay Flats Env. Technology Site / Kaiser-Hill Company, L.L.C.

(Name of Laboratory, Site or Organization)

M. T. Vess

Facility Manager

Telephone No.: (303)966-6540

(Facility Manager/Designee)

JENSEN, J A

OCCURRENCE INVESTIGATOR

Telephone No.: (303)966-4946

(Originator/Transmitter)

R. L Burns (Telcon)

Date: 11/08/1996

(Authorized Classifier (AC))

1. OCCURRENCE REPORT NUMBER: RFO--KHLL-ENVOPS-1996-0011  
Release Of F001 Listed Waste Water To Soil

2. REPORT TYPE AND DATE:	Date	Time
[ ] Notification	10/08/1996	1222 MTZ
[ ] Initial Update	11/04/1996	0748 MTZ
[ ] Latest Update	11/08/1996	1347 MTZ
[X] Final	11/13/1996	1051 MTZ

3. OCCURRENCE CATEGORY:

[ ] Emergency [ ] Unusual [X] Off-Normal [ ] Cancelled

4. NUMBER OF OCCURRENCES: 1 ORIG. OR:

5. DIVISION OR PROJECT: Kaiser-Hill Company, L.L.C.

6. SECRETARIAL OFFICE: EM - Environmental Management

7. SYSTEM, BLDG., OR EQUIPMENT:  
Operable Unit II, Seep Location SW-59

8. UCNIP. No

9. PLANT AREA: Operable Unit II

10. DATE AND TIME DISCOVERED:  
10/07/1996 1000 (MTZ)

11. DATE AND TIME CATEGORIZED:  
10/07/1996 1135 (MTZ)

01. NOTIFICATION:

OTHER NOTIFICATIONS:

10/07/1996	1155 (MTZ)	WRP, Harold Wells (by FD)	DYNCORP
10/08/1996	0830 (MTZ)	CDPH&E, Alstatt by Wells	COLORADO
10/08/1996	0600 (MTZ)	CDPH&E, Kray by Jensen	COLORADO
10/08/1996	0800 (MTZ)	CDH/EMU, Jones by Wells	COLORADO
10/07/1996	1158 (MTZ)	Fac Rep, McCranie (by FD)	DOE/RFFO

SUBJECT OR TITLE OF OCCURRENCE:

Release Of F001 Listed Waste Water To Soil

NATURE OF OCCURRENCE:

02) Environmental

B. Hazardous Substances/Regulated Pollutants/Oil Releases

DESCRIPTION OF OCCURRENCE:

During normal operations, it was noted that less than one gallon, but, more than one pint of F001 Resource Conservation and Recovery Act (RCRA) listed waste water was released to the soil from a leaking gauge connection.

17. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE:

Normal Operations

18. ACTIVITY CATEGORY:

Normal Operations

19. IMMEDIATE ACTIONS TAKEN AND RESULTS:

1. The RCRA Contingency plan was implemented at the direction of Kaiser Hill Compliance and Performance Assurance group.

2. The connection was tightened which stopped the leak.

3. The area was contained and the soil and rock affected was cleaned up and disposed of per approved procedure.

4. Confirmatory sampling was taken to verify proper and adequate cleanup (Environmental Protection Agency (EPA) sample #22101 DL and Building 881 sample #SS00033RG).

20. DIRECT CAUSE:

1) EQUIPMENT/MATERIAL PROBLEM

A. Defective or Failed Part

21. CONTRIBUTING CAUSE(S):

22. ROOT CAUSE:

1) EQUIPMENT/MATERIAL PROBLEM

A Defective or Failed Part

23 DESCRIPTION OF CAUSE:

The cause analysis documentation for this occurrence is being maintained in the Occurrence Report history file.

Both the direct and root cause have been determined to have been a leaking (faulty) gauge connection. The cause of the loose connection may be attributable to an individual who may have bumped into the fitting during installation of insulation. The entire system pressure tested satisfactorily approximately two (2) weeks ago. This pressure testing was covered as part of a tank modification in Internal Work Control Package (IWCP) #T0087005.

The minimal release is directly attributed to a required 24 hour inspection as required by RCRA driven tank and pipe inspections.

24 EVALUATION: (By Facility Manager/Designee)

Due to the requirement for regularly scheduled system inspections, the RCRA regulated material release was held to a minimum, however, the presence of secondary containment may have prevented any requirements for RCRA release reporting to both State and Federal Agencies, and will be investigated for feasibility for installation.

Personnel working on or near these systems must remain alert to the potential for leaks due to bumping or otherwise disturbing fittings, gauges and connections, and must, as a precaution notify appropriate supervision of these occurrences

25. IS FURTHER EVALUATION REQUIRED?:

Yes [ ]

No [X]

26. CORRECTIVE ACTIONS:

(\* = Date added/revised since final report was signed off)

- 01) Provide continued appropriate training of personnel to conduct tank & pipe inspections per all applicable Policies, Procedures, and Agreements.

TARGET COMPLETION DATE: 10/08/1996 COMPLETION DATE: 10/08/1996

- 02) Evaluate the feasibility of installation of secondary containment to preclude a release to the soil from any future, similar occurrences.

TARGET COMPLETION DATE: 11/04/1996 COMPLETION DATE: 11/04/1996

- 03) Check/re-check, and tighten all fittings, hose connections and other points of potential leakage on an appropriate schedule to avert future releases.

CORRECTIVE ACTIONS: (continued)  
(\* = Date added/revised since final report was signed off)

TARGET COMPLETION DATE: 10/08/1996 COMPLETION DATE: 10/08/1996

IMPACT ON ENVIRONMENT, SAFETY AND HEALTH:  
Impact on Environment, Safety, & Health

There was considered to be only minimal initial impact on the environment, and no impact on Personnel Safety and/or Health.

PROGRAMMATIC IMPACT:

There were only minimal identified programmatic impacts resulting from this occurrence.

IMPACT UPON CODES AND STANDARDS:

There were no identified impacts on Codes and Standards.

LESSONS LEARNED:

Due to Policy, Procedure, and Agreement driven inspections of RCRA associated tanks and piping systems, a much larger release was averted, thus substantially reducing clean-up efforts required.

SIMILAR OCCURRENCE REPORT NUMBERS:

1) RFO--EGGR-ENVOPS-1993-0002

USER FIELD #1:

961565

USER FIELD #2:

DOE FACILITY REPRESENTATIVE INPUT:

Entered by:

Date:

DOE PROGRAM MANAGER INPUT:

Entered by:

Date:

SIGNATURES: (FM's original signature on hardcopy)

Approved by: M. T. Vess  
Facility Manager/Designee

Date: 11/08/1996  
Telephone No.: (303) 966-6540

55 SIGNATURES. (FM's original signature on hardcopy) (continued)

Approved by: CHRIST, JOSEF W Date: 11/13/1996  
DOI Facility Representative/Designee Telephone No.: (303)966-7717

Approved by: Approval delegated to FR Date:  
DOI Program Manager/Designee Telephone No.:

303 966

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

22101 DL

Name: E.G.&G., Rocky Flats Contract:   
 Lab Code: GLAB Case No.: SAS No.: 97L0 SDG No.:   
 Matrix: (soil/water) SOIL Lab Sample ID: S900033RG   
 Sample wt/vol: 2.500 (g/mL) G Lab File ID: OCT1501   
 Level: (low/med) LOW Date Received: 10/07/96   
 Moisture: not det. Not Det. Date Analyzed: 10/15/96   
 GC Column: DBVRX ID: .32 (mm) Dilution Factor: 2.0   
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q

74-87-3	Chloromethane	20.	U D
74-83-9	Bromomethane	20.	U D
75-01-4	Vinyl Chloride	20.	U D
75-00-3	Chloroethane	20.	U D
75-09-2	Methylene Chloride	10.	U D
67-64-1	Acetone	5.	BJD
75-15-0	Carbon Disulfide	10.	U D
75-35-4	1,1-Dichloroethene	10.	U D
75-34-3	1,1-Dichloroethane	10.	U D
544-59-2	1,2-Dichloroethene (total)	10.	U D
67-66-3	Chloroform	10.	U D
107-06-2	1,2-Dichloroethane	10.	U D
78-93-3	2-Butanone	3.	BJD
71-55-6	1,1,1-Trichloroethane	10.	U D
56-23-5	Carbon Tetrachloride	10.	U D
75-27-4	Bromodichloromethane	10.	U D
78-87-5	1,2-Dichloropropane	10.	U D
10061-01-5	dis-1,3-Dichloropropene	10.	U D
79-01-6	Trichloroethene	10.	U D
124-48-1	Dibromochloromethane	10.	U D
79-00-5	1,1,2-Trichloroethane	10.	U D
71-43-2	Benzene	10.	U D
10061-02-6	trans-1,3-Dichloropropene	10.	U D
75-25-2	Bromoform	10.	U D
108-10-1	4-Methyl-2-Pentanone	20.	U D
591-78-6	2-Hexanone	20.	U D
127-18-4	Tetrachloroethene	2.	JD
79-34-5	1,1,2,2-Tetrachloroethane	10.	U D
108-88-3	Toluene	10.	U D
108-90-7	Chlorobenzene	10.	U D
100-41-4	Ethylbenzene	10.	U D
100-42-5	Styrene	10.	U D
1330-20-7	Xylene (total)	10.	U D

PCE is prob. in the GC/MS auto sampler  
 it was in the prev. days blank. they have

115

## **SECTION 3.0**

### **OTHER SIGNIFICANT EVENTS (TO DATE)**

**PAC REFERENCE NUMBER: 900-119.1**

IHSS Reference Number 119 1, Operable Unit 1  
Unit Name West Scrap Metal Storage and Solvent Spill Area  
Approximate Location N748,000, E2,085,000

Date(s) of Operation or Occurrence

September 1968 – November 1971

Description of Action Taken

A groundwater collection and treatment system was installed in 1992 and consists of a 1,435 foot long French Drain and a separate up-gradient Collection Well. The Collection Well collects volatile organic compound (VOC) contaminated groundwater from within the plume, with trichloroethene as the primary contaminant. The French Drain was installed to prevent potential down-gradient contaminant migration. Water collected is treated in the Combined Water Treatment Facility (Building 891).

The groundwater in the French Drain is collected and pumped from a central sump to the Combined Water Treatment Facility (CWTF) through existing buried pipes. Water from the Collection Well is collected using a portable trailer and then transported to the CWTF for treatment. The corrected total June 2000 water volumes collected were 6,120 gallons from the French Drain, and 1,550 gallons collected from the Collection Well. For the period of July through August 29, 2000 the water volume collected from the French Drain was 7,740 gallons. Water volumes extracted from the Collection well were 540 gallons in July and 990 gallons in August. Because of the lock-out/tag-out of the system put in-place for decommissioning the French Drain, no water was collected in September from the Collection Well.

Description of Project Events and Effectiveness

Both the French Drain and Collection Well are sampled quarterly and were sampled August 24, 2000 for this quarter. At present, sample results have not been received however, will be reported in the next Quarterly Plume Monitoring Report. Sample results from the June 20, 2000 sampling event are shown below.

**Table 3.1 IHSS 119.1 Sampling Results (Groundwater Plume)**

Analyte	Collection Well (ug/l)	French Drain (ug/l)	RFCA Groundwater Tier 2 Action Levels (ug/l)
Tetrachloroethene	50	0.2 J	5
Trichloroethene	370	1.0	5
1,1-Dichloroethene	21	ND	7
Methylene Chloride	6 JB	ND	5

\* Note: Results are for the June 20, 2000 Sampling Event (detected concentrations only)

#### Action/No Further Action Recommendation

Because groundwater collected by the French Drain is consistently below RFCA Tier 2 Action Levels, the OU1 Corrective Action Decision (CAD)/Record of Decision (ROD) (DOE, 1997) included decommissioning the French Drain. Based on the declining concentrations of VOCs in the plume, the OU1 CAD/ROD Modification (in progress) is expected to include one year continued extraction and treatment of groundwater from the Collection Well, then utilizing the Collection Well to continue monitoring the plume.

Decommissioning of the French Drain began on August 31, 2000 and is expected to be completed by September 30, 2000. Water from the French Drain is no longer collected or sampled.

#### References

DOE, 1997, *Corrective Action Decision/Record of Decision, Operable Unit 1 881 Hillside Area, IHSS 119.1, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO*, February

# **Appendix 1**

## **CERCLA Sites**

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NORTHEAST BUFFER ZONE							
110	BZ	NE-110	Trench T-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	-
111 1	BZ	NE-111 1	Trench T-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
111 2	BZ	NE-111 2	Trench T-5	HRR <sup>1</sup>	-	-	-
111 3	BZ	NE-111 3	Trench T-6	HRR <sup>1</sup>	-	-	-
111 4	BZ	NE-111 4	Trench T-7	HRR <sup>1</sup>	-	-	-
111 5	BZ	NE-111 5	Trench T-8	HRR <sup>1</sup>	-	-	-
111 6	BZ	NE-111 6	Trench T-9	HRR <sup>1</sup>	-	-	-
111 7	BZ	NE-111 7	Trench T-10	HRR <sup>1</sup>	-	-	-
111 8	BZ	NE-111 8	Trench T-11	HRR <sup>1</sup>	-	-	-
142 1	6	NE-142 1	Pond A-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 2	6	NE-142 2	Pond A-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 3	6	NE-142 3	Pond A-3	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 4	6	NE-142 4	Pond A-4	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 5	6	NE-142 5	Pond B-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 6	6	NE-142 6	Pond B-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 7	6	NE-142 7	Pond B-3	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 8	6	NE-142 8	Pond B-4	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 9	6	NE-142 9	Pond B-5	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-

120

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
142 12	6	NE-142 12	Flume Pond (IAG Name Newly Identified Pond A-5) (Off-scale of Plate #2)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
156 2	6	NE-156 2	Soil Dump Area between the A and B Series Drainages	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
166 1	6	NE-166 1	Trench A	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
166 2	6	NE-166 2	Trench B	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
166 3	6	NE-166 3	Trench C	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
			(2 areas designated on Plate #2)				
167 1	6	NE-167 1	Landfill North Area Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
167 2	7	NE-167 2	Pond Area Spray Field (Center Area)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
167 3	7	NE-167 3	South Area Spray Field	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
216 1	6	NE-216 1	East Spray Fields - North Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
216 2	BZ	NE-216 2	East Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
216 3	BZ	NE-216 3	East Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
NA	BZ	NE-1400	Tear Gas Powder Release	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	BZ	NE-1401	NE Buffer Zone Gas Line Break	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	BZ	NE-1402	East Inner Gate PCB Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	BZ	NE-1403	Gasoline Spill - Building 920 Guard Post	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
142 6	BZ	NE-1404	Gasoline Spill - Building 920 Guard Post	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
			Gasoline Spill - Building 920 Guard Post	Quarterly 3 <sup>5</sup>	Quarterly 3 <sup>5</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>

121

Appendix 1. HRR Sites at RFETS.

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	BZ	NE-1405	Diesel Fuel Spill at Field Treatability Unit (identified as NE-1404, reassigned NE-1405 in Quarterly 7 <sup>9</sup> )	Quarterly 3 <sup>6</sup>	Quarterly 4 <sup>8</sup> Quarterly 7 <sup>9</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NE-1406	771 Hillside Sludge Release	Quarterly 4 <sup>8</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NE-1407	OU 2 Treatment Facility	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup> (900-1312) Quarterly 8 <sup>15</sup> (900-1309)	-	-
NA	BZ	NE-1408	OU 2 Test Well (formerly NE-1406)	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup>	2000 <sup>29</sup>
NA	BZ	NE-1409	Diesel Fuel Spill at Field Treatment System Spill	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup> Annual 2000 <sup>23</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>23</sup>	-
NA	BZ	NE-1410	Diesel Fuel Spill at Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	-
NA	BZ	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	-
NA	BZ	NE-1412	Trench T-12 Located in OU-2 East Trenches	Quarterly 10 <sup>11</sup>	-	-	-
NA	BZ	NE-1413	Trench T-13 Located in OU-2 East Trenches	Quarterly 10 <sup>11</sup>	-	-	-
114	7	NW-114	Present Landfill	HRR <sup>1</sup>	-	-	-
170	BZ	NW-170	PU&D Storage Yard - Waste Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup>	-

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
174A	BZ	NW-174A	PU&D Yard Container Storage Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>		-
174B	BZ	NW-174B	PU&D Container Storage Facilities	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup>	1999 <sup>28</sup>
195	16	NW-195	Nickel Carbonyl Disposal	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>
203	7	NW-203	Inactive Hazardous Waste Storage Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NW-1500	Diesel Spill at PU&D Yard (formerly NW-175)	Quarterly 3 <sup>6</sup>	Quarterly 7 <sup>9</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NW-1501	Asbestos Release at PU&D Yard (formerly NW-176)	Quarterly 3 <sup>6</sup>	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup>	2000 <sup>29</sup>
114	7	NW-1502	Improper Disposal of Diesel-Contaminated Material at Landfill (formerly NW-177)	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	-
114	7	NW-1503	Improper Disposal of Fuel Contaminated Material at Landfill	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	-
114	7	NW-1504	Improper Disposal of Thorosilane Contaminated Material at Landfill	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	-
<b>SOUTHEAST BUFFER ZONE</b>							
142 10	5	SE-142 10	Pond C-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 11	5	SE-142 11	Pond C-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
209	5	SE-209	Surface Disturbance Southeast of Bldg 881	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
NA	BZ	SE-1600	Pond 7 - Steam Condensate Releases	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	BZ	SE-1601	Pond 8 - Cooling Tower Discharge Releases	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>

123

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
155	BZ	SE-1602	East Firing Range	Annual 1999 <sup>23</sup>	-	-	-
<b>SOUTHWEST BUFFER ZONE</b>							
115	IA	SW-115	Original Landfill	HRR <sup>1</sup>	-	-	-
133 1	5	SW-133 1	Ash Pit 1	HRR <sup>1</sup>	-	-	-
133 2	5	SW-133 2	Ash Pit 2	HRR <sup>1</sup>	-	-	-
133 3	5	SW-133 3	Ash Pit 3	HRR <sup>1</sup>	-	-	-
133 4	5	SW-133 4	Ash Pit 4	HRR <sup>1</sup>	-	-	-
133 5	5	SW-133 5	Incinerator Facility	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
133 6	5	SW-133 6	Concrete Wash Pad	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
196	IA	SW-196	Water Treatment Plant Backwash Pond	HRR <sup>1</sup>	-	-	-
NA	BZ	SW-1700	Fuel Spill into Woman Creek Drainage	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	BZ	SW-1701	Recently Identified Ash Pit (also referred to as TDEM-1)	Quarterly 9 <sup>13</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
NA	BZ	SW-1702	Recently Identified Ash Pit (also referred to as TDEM-2)	Quarterly 9 <sup>13</sup>	-	-	-
<b>100-340</b>							
101	IA	000-101	207 Solar Evaporation Ponds	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	-	-
121	IA	000-121	Original Process Waste Lines (Includes Tanks T-2, T-3, T-10, T-14, T-16, T-40)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1998 <sup>7</sup> (UBC 123)	-	-
162	IA	000-162	Radioactive Site - 700 Area Site # 2	HRR <sup>1</sup>	-	-	-
168	11	000-168	West Spray Field	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 11 CAD/ROD <sup>14</sup>

124

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
172	IA	000-172	Central Avenue Waste Spill	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
190	IA	000-190	Caustic Leak (also referred to as Central Avenue Ditch)	HRR <sup>1</sup>	-	-	-
192	16	000-192	Antifreeze Discharge	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>
NA	IA	000-500	Sanitary Sewer System (not shown on Plate 4)	HRR <sup>1</sup>	-	-	-
NA	BZ	000-501	Roadway Spraying	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	000-502 (see 900-1310)	ITS Water Spill (identified in Quarterly 2 as 000-502, re-assigned as 900-1310 in Quarterly 7, The number 000-502 is no longer in use)	Quarterly 2 <sup>5</sup>	NA-	NA-	NA-
NA	IA	000-503	Solar Pond Water Spill Along Central Avenue	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	-
NA	IA	000-504	New Process Waste Lines	Annual 1999 <sup>23</sup>	-	-	-
NA	IA	000-505	Storm Drains	Annual 1999 <sup>23</sup>	-	-	-
148	IA	100-148	Waste Spills	HRR <sup>1</sup>	Annual 1998 <sup>7</sup> (UBC 123)	-	-
NA	IA	100-600	Mercury Spill - Valve Vault 124-B, Building 124	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-601	Building 123 Phosphoric Acid Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-602	Building 123 Process Waste Line Break	HRR <sup>1</sup>	-	-	-
NA	IA	100-603	Building 123 Bioassay Waste Spill	HRR <sup>1</sup>	-	-	-

125

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	100-604	T130 Complex Sewer Line Leaks	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-605	Building 115 Hydraulic Oil Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-606	Building 125 TCE Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-607	Building 111 Transformer PCB Leaks	HRR <sup>1</sup>	Annual 2000 <sup>26</sup>	-	-
NA	IA	100-608	Building 131 Transformer Leak	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	IA	100-609	Building 121 Security Incinerator	HRR <sup>1</sup>	-	-	-
NA	IA	100-610	Asbestos Release - Building 123	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-611	Building 123 Scrubber Solution Spill	HRR <sup>1</sup>	-	-	-
NA	IA	100-612	Battery Solution Spill - Building 119	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	100-613	Asphalt Surface in Lay Down Yard North of Building 130 (identified as 000-501 in Quarterly 4 <sup>8</sup> , reassigned as 100-613 in Quarterly 7 <sup>9</sup> )	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	-
300-AREA							
128	IA	300-128	Oil Burn Pit No 1	HRR <sup>1</sup>	-	-	-
134N	IA	300-134N	Lithium Metal Destruction Site	HRR <sup>1</sup>	-	-	-
134S	IA	300-134S	Lithium Metal Destruction Site	HRR <sup>1</sup>	-	-	-
135	IA	300-135	Cooling Tower Blowdown	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
151	IA	300-151	Tank 262 Fuel Oil Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
300-AREA							
171	IA	300-171	Solvent Burning Ground	HRR <sup>1</sup>	-	-	-

126

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
181	IA	300-181	Building 334 Cargo Container Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
186	IA	300-186	Valve Vault 12	HRR <sup>1</sup>	-	-	-
188	IA	300-188	Acid Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
206	IA	300-206	Inactive D-836 Hazardous Waste Tank	HRR <sup>1</sup>	-	-	-
212	IA	300-212	Building 371 Drum Storage Area, Unit 63 (deferred to Part VIII of the RFETS RCRA Mixed Residues Modification, see Annual 1997)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
NA	IA	300-700	Scrap Roofing Disposal	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-701	Sulfuric Acid Spill - Building 371	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-702	Pesticide Shed	HRR <sup>1</sup>	-	-	-
NA	IA	300-703	Building 331 North Area	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-704	Roof Fire, Building 381	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-705	Potassium Hydroxide Spill North of Building 374	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-706	Evaporator Tanks North of Building 374	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-707	Sanitizer Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-708	Transformers North of Building 371	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	300-709	Transformer Leak 334-1	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	300-710	Gasoline Spill North of Building 331	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	300-711	Ni-Cad Battery Spill Outside of Building 373	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	-
NA	IA	300-712	1/2 gal Antifreeze Spilled by Street Sweeper Outside of Building 373	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	300-713	Caustic Spill North of Building 331	Quarterly 8 <sup>15</sup>	-	Quarterly 8 <sup>15</sup>	-
NA	IA	300-714	Laundry Waste Water Spill From Tank T-803, North of Building 374	Quarterly 10 <sup>11</sup>	-	Quarterly 10 <sup>11</sup>	-
NA	IA	300-715	Battery Acid Spill	Annual 1997 <sup>3</sup>	-	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
116 1	IA	400-116 1	West Loading Dock, Building 447 (IAG Name West Loading Dock Area)	HRR <sup>1</sup>	-	-	-
116 2	IA	400-116 2	South Loading Dock, Building 444 (IAG Name South Loading Dock Area)	HRR <sup>1</sup>	-	-	-
122	IA	400-122	Underground Concrete Tank	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
129	IA	400-129	Building 443 Oil Leak (deferred to IA OU, see Annual 1997)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	-	-
136 1	IA	400-136 1	Cooling Tower Pond West of Building 444 (IAG Name: Cooling Tower Pond Northeast Corner of Building 460)	HRR <sup>1</sup>	-	-	-
136.2	IA	400-136.2	Cooling Tower Pond East of Building 444 (IAG Name: Cooling Tower Pond West of Building 460)	HRR <sup>1</sup>	-	-	-
157 1	IA	400-157 1	Radioactive Site North Area	HRR <sup>1</sup>	-	-	-
157.2	IA	400-157 2	Radioactive Site South Area	HRR <sup>1</sup>	-	-	-
182	IA	400-182	Building 444/453 Drum Storage Area	HRR <sup>1</sup>	-	-	-

128

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
187	IA	400-187	Sulfuric Acid Spill (IAG Name Acid Leaks (2))	HRR <sup>1</sup>	-	-	-
191	IA	400-191	Hydrogen Peroxide Spill	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
193	16	400-193	Steam Condensate Leak	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>
204	15	400-204	Original Uranium Chip Roaster (deferred to D&D and UBC 447, see OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
205	IA	400-205	Building 460 Sump #3 Acid Side	HRR <sup>1</sup>	-	-	-
207	IA	400-207	Inactive 444 Acid Dumpster	HRR <sup>1</sup>	-	-	-
208	IA	400-208	Inactive 444/447 Waste Storage Area	HRR <sup>1</sup>	-	-	-
NA	IA	400-800	Transformer 443-1	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	IA	400-801	Transformer, Roof of Building 447	HRR <sup>1</sup>	-	-	-
NA	IA	400-802	Storage Area, South of Building 334	HRR <sup>1</sup>	-	-	-
NA	IA	400-803	Miscellaneous Dumping, Building 460 Storm Drain	HRR <sup>1</sup>	-	-	-
NA	IA	400-804	Road North of Building 460	HRR <sup>1</sup>	-	-	-
NA	IA	400-805	Building 443 Tank #9 Leak	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	400-806	Catalyst Spill, Building 440	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	400-807	Sandblasting Area	HRR <sup>1</sup>	-	-	-
NA	IA	400-808	Vacuum Pump Leak - Building 442	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	400-809	Oil Leak - 446 Guard Post	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	400-810	Beryllium Fire - Building 444	HRR <sup>1</sup>	-	-	-

Kaiser-Hill Company, L L C  
Annual Update for the Historical Release Report

Appendix 1. HRR Sites at RFETS						
IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA Recommendation Approved
NA	IA	400-811	Transformer 443-2, Building 443	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup> 1999 <sup>28</sup>
NA	IA	400-812	Tank T-2 Spill in Building 460	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup> Quarterly 8 <sup>15</sup>	Quarterly 8 <sup>15</sup> -
NA	IA	400-813	RCRA Tank Leak in Building 460	Quarterly 7 <sup>9</sup>	-	-
NA	IA	400-814	Air Conditioner Compressor Release, Bldg 444 Roof	Quarterly 8 <sup>15</sup>	-	Quarterly 8 <sup>15</sup> -
NA	IA	400-815	RCRA Tank Leak in Building 460	Quarterly 8 <sup>15</sup>	-	-
NA	IA	400-820 (see 600-1004)	Central Avenue Ditch Soil Spreading (identified in Quarterly 6 as 400-820, re-assigned as 600-1004 in Quarterly 7, The number 400-820 is no longer in use)	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup>	NA NA
1171	IA	500-1171	North Site Chemical Storage	HRR <sup>1</sup>	-	-
1172	IA	500-1172	Middle Site Chemical Storage	HRR <sup>1</sup>	-	-
158	IA	500-158	Radioactive Site - Building 551	HRR <sup>1</sup>	-	-
159	IA	500-159	Radioactive Site - Building 559	HRR <sup>1</sup>	-	-
169	IA	500-169	Radioactive Site - Building 559	HRR <sup>1</sup>	Annual 1998 <sup>7</sup> Annual 2000	Annual 1998 <sup>7</sup> -
197	IA	500-197	Scrap Metal Sites	HRR <sup>1</sup>	-	-
NA	IA	500-900	Transformer Leak - 515/516	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup> -
NA	IA	500-901	Transformer Leak - 555	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup> -

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	500-902	Transformer Leak - 559	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	500-903	RCRA Storage Unit #1	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	500-904	Transformer Leak - 223-1/223-2	HRR <sup>1</sup>	-	-	-
NA	IA	500-905	Transformer Leak - 558-1	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	500-906	Asphalt Surface Near Building 559	Quarterly 4 <sup>8</sup>	-	-	-
172	IA	500-907	Tanker Truck Release of Hazardous Waste From Tank 231B	Quarterly 9 <sup>13</sup>	-	-	-
156 1, 186	IA	500-908	Oil Released from Air Compressor	Quarterly 12 <sup>17</sup>	-	Quarterly 12 <sup>17</sup>	-
158	IA	500-909	Release of Spent Photographic Fixer Solution	Annual 1996 <sup>2</sup>	-	Annual 1996 <sup>2</sup>	-
117 3	IA	600-117 3	Chemical Storage - South Site	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
120 1	IA	600-120 1	Fiberglassing Area North of Building 664	HRR <sup>1</sup>	-	-	-
120.2	IA	600-120 2	Fiberglassing Area West of Building 664	HRR <sup>1</sup>	-	-	-
152	IA	600-152	Fuel Oil Tank 221 Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
160	IA	600-160	Radioactive Site Building 444 Parking Lot	HRR <sup>1</sup>	-	-	-
161	IA	600-161	Radioactive Site - Building 664	HRR <sup>1</sup>	-	-	-
189	IA	600-189	Transformer Storage Building 662	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
NA	IA	600-1000	Transformer Storage Building 662	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	600-1001	Temporary Waste Storage Building 663	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	
NA	IA	600-1001 (C)	Waste Oil Storage Building 663	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
NA	IA	600-1002	Transformer Storage - West of Building 666	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	600-1003	Transformers North and South of 661-675 Substation	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
152, 157 1, 172	IA	600-1004	Central Avenue Ditch Cleaning Incident (formerly identified as 400-820)	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup>	-	-
NA	IA	600-1005	Former Pesticide Storage Area	Quarterly 7 <sup>9</sup>	-	-	-
118 1	IA	700-118 1	Multiple Solvent Spills West of Building 730	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	-	-
118 2	IA	700-118 2	Multiple Solvent Spills South End of Building 776	HRR <sup>1</sup>	-	-	-
123 1	IA	700-123 1	Valve Vault	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
123 2	IA	700-123 2	Valve Vault West of Building 707	HRR <sup>1</sup>	-	-	-
124 1	IA	700-124 1	30,000 Gallon Tank (Tank #68)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
124 2	IA	700-124 2	14,000 Gallon Tank (Tank #66)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
124 3	IA	700-124 3	14,000 Gallon Tank (Tank #67)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-

132

**Appendix 1. HRR Sites at RFETS**

IISS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
125	IA	700-125	Holding Tank (Tank #66)	HRR <sup>1</sup>	-	-	-
126 1	IA	700-126 1	Westernmost Out-of-Service Waste Tank	HRR <sup>1</sup>	-	-	-
126 2	IA	700-126 2	Easternmost Out-of-Service Waste Tank	HRR <sup>1</sup>	-	-	-
127	IA	700-127	Low-Level Radioactive Waste Leak	HRR <sup>1</sup>	-	-	-
131	IA	700-131	Radioactive Site - 700 Area Site #1	HRR <sup>1</sup>	-	-	-
132	IA	700-132	Radioactive Site - 700 Area Site #4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121) Annual 1997 <sup>3</sup>	-	-
137	IA	700-137	Cooling Tower Blowdown Buildings 712 and 713 (IAG Name Cooling Tower Blowdown Building 774)	HRR <sup>1</sup>	-	-	-
138	IA	700-138	Cooling Tower Blowdown Building 779	HRR <sup>1</sup>	-	-	-
139 1N(a)	IA	700-139 1N(a)	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
139 1N(b)	IA	700-139 1N(b)	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>			
139 1S	IA	700-139 1S	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>			
139 2	IA	700-139 2	Caustic/Acid Spills Hydrofluoric Acid Tanks	HRR <sup>1</sup>	-	-	-
143	IA	700-143	Bldg 771 Outfall	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	-
144	IA	700-144(N)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR <sup>1</sup>	-	-	-
144	IA	700-144(S)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR <sup>1</sup>	-	-	-
146 1	IA	700-146 1	Concrete Process Waste Tanks 7,500 Gallon Tank (31)	HRR <sup>1</sup>	-	-	-

Appendix 1 HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
146 2	IA	700-146 2	Concrete Process Waste Tanks 7,500 Gallon Tank (32)	HRR <sup>1</sup>	-	-	-
146 3	IA	700-146 3	Concrete Process Waste Tanks 7,500 Gallon Tank (34W)	HRR <sup>1</sup>	-	-	-
146 4	IA	700-146 4	Concrete Process Waste Tanks 7,500 Gallon Tank (34E)	HRR <sup>1</sup>	-	-	-
146 5	IA	700-146 5	Concrete Process Waste Tanks 3,750 Gallon Tank (30)	HRR <sup>1</sup>	-	-	-
146 6	IA	700-146 6	Concrete Process Waste Tanks 3,750 Gallon Tank (33)	HRR <sup>1</sup>	-	-	-
147 1	IA	700-147 1	Process Waste Line Leaks (IAG Name Maas Area)	HRR <sup>1</sup>	-	-	-
149 1	IA	700-149 1	Effluent Pipe	HRR <sup>1</sup>	-	-	-
149 2	IA	700-149 2	Effluent Pipe	HRR <sup>1</sup>	-	-	-
150 1	IA	700-150 1	Radioactive Site North of Building 771 (IAG Name: Radioactive Leak North of Building 771)	HRR <sup>1</sup>	-	-	-
150 2	IA	700-150 2	Radioactive Site West of Buildings 771 and 776 (IAG Name: Radioactive Leak West of Building 771)	HRR <sup>1</sup>	-	-	-
150 3	IA	700-150 3	Radioactive Site Between Buildings 771 & 774 (IAG Name: Radioactive Leak Between Buildings 771 & 774)	HRR <sup>1</sup>	-	-	-
150 4	IA	700-150 4	Radioactive Site Northwest of Building 750 (IAG Name: Radioactive Leak East of Building 750)	HRR <sup>1</sup>	-	-	-
150 5	IA	700-150 5	Radioactive Site West of Building 707 (IAG Name: Radioactive Leak West of Building 707)	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>23</sup>

134

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
150 6	IA	700-150 6	Radioactive Site South of Building 779 (IAG Name Radioactive Leak South of Building 779)	HRR <sup>1</sup>	-	-	-
150 7	IA	700-150 7	Radioactive Site South of Building 776 (IAG Name Radioactive Leak South of Building 776)	HRR <sup>1</sup>	-	-	-
150 8	IA	700-150 8	Radioactive Site Northeast of Building 779 (IAG Name, Radioactive Leak Northeast of Building 779)	HRR <sup>1</sup>	-	-	-
163 1	IA	700-163 1	Radioactive Site 700 Area Site No 3 Wash Area	HRR <sup>1</sup>	-	-	-
163 2	IA	700-163 2	Radioactive Site 700 Area Site No 3 Burned Slab	HRR <sup>1</sup>	-	-	-
185	16	700-185	Solvent Spill	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>1/2</sup>
194	16	700-194	Steam Condensate Leak	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>1/2</sup>
214	IA	700-214	750 Pad Pondcrete & Saltcrete Storage, Unit 25	HRR <sup>1</sup>	-	-	-
215	IA	700-215	Tank T-40, Unit 55 13	HRR <sup>1</sup>	-	-	-
NA	IA	700-1100	French Drain North of Building 776/777	HRR <sup>1</sup>	-	-	-
NA	IA	700-1101	Laundry Tank Overflow - Building 732	HRR <sup>1</sup>	-	-	-
NA	IA	700-1102	Transformer Leak - Building 707	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 Annual 1998	Annual 1996 <sup>2</sup> Annual 1997	-
NA	IA	700-1103	Leaking Transformers - Building 707	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	700-1104	Leaking Transformers - Building 708	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	700-1105	Transformer Leak - 779-1/779-2	HRR <sup>1</sup>	-	-	-
NA	IA	700-1106	Process Waste Spill - Portal 1	HRR <sup>1</sup>	-	-	-
NA	IA	700-1107	Compressor Waste Oil Spill - Building 776	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>

135

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	700-1108	771774 Footing Drain Pond	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
NA	IA	700-1109	Uranium Incident - Building 778	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	700-1110	Nickel Carbonyl Burial West of Building 771	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	700-1111	Leaking Transformer - Building 750	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	700-1112	Leaking Transformer - 776-5	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
101	IA	700-1113	Water Released from 207C Solar Evaporation Pond	Quarterly 11 <sup>18</sup>	-	Quarterly 11 <sup>18</sup>	-
NA	IA	700-1114a	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	-	Annual 1997 <sup>3</sup>	-
NA	IA	700-1114b	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	-	Annual 1997 <sup>3</sup>	-
NA	IA	700-1115	Identification of Diesel Fuel in Subsurface Soils	Annual 1997 <sup>3</sup>	-	-	-
150 7	IA	700-1116	Leaking Transformer South of Building 776	Annual 1998 <sup>7</sup>	-	-	-
NA	IA	700-1117	Building 701 Water Line, Soil Put-back	Annual 1998 <sup>7</sup>	-	Annual 1998 <sup>7</sup>	CDPHE 1998 <sup>19</sup>
<b>Summary</b>							
102	1	800-102	Oil Sludge Pit	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
103	1	800-103	Chemical Burial	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
104	1	800-104	Liquid Dumping	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
105 1	1	800-105 1	Bldg 881 Westernmost Out of Service Fuel Tanks	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
105 2	1	800-105 2	Bldg 881 Easternmost Out of Service Fuel Tanks	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
106	1	800-106	Bldg 881, Outfall	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
107	1	800-107	Bldg 881, Hillside Oil Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
145	1	800-145	Sanitary Waste Line Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
147 2	IA	800-147 2	Bldg Conversion Activity Contamination Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
164 2	IA	800-164 2	Radioactive Site 800 Area Site #2, Building 886 Spills	HRR <sup>1</sup>	-	-	-
164 3	IA	800-164 3	Radioactive Site 800 Area Site #2, Building 889 Storage Pad	HRR <sup>1</sup>	-	-	-
177	BZ	800-177	Building 885 Drum Storage and Paint Storage (IAG Name Building 885 Drum Storage Area)	HRR <sup>1</sup>	-	-	-
178	15	800-178	Building 881 Drum Storage Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>21</sup>
179	15	800-179	Building 865 Drum Storage Area (defer to D&D and UBC 865, refer to OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
180	15	800-180	Building 883 Drum Storage Area (defer to D&D and UBC 883, refer to OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
211	15	800-211	Building 881 Drum Storage, Unit 26	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>22</sup>
217	15	800-217	Building 881, CN Bench Scale Treatment, Unit 32	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>22</sup>
NA	IA	800-1200	Valve Vault 2	HRR <sup>1</sup>	-	-	-
NA	IA	800-1201	Radioactive Site South of Building 883	HRR <sup>1</sup>	-	-	-
NA	IA	800-1202	Sulfuric Acid Spill, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	800-1204	Building 866 Spills	HRR <sup>1</sup>	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	800-1205	Building 881, East Dock	HRR <sup>1</sup>	-	-	-
NA	IA	800-1206	Fire, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	800-1207	Transformer 883-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1208	Transformer 881-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1209	Leaking Transformers, 800 Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1210	Transformer 865-1 and 865-2	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1211	Capacitor Leak, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	800-1212	Building 866 Sump Spill	Quarterly 5 <sup>10</sup>	-	-	-
108					Annual 1997 <sup>3</sup> Annual 1998 <sup>3</sup> Annual 2000 <sup>3</sup>	Annual 1999 <sup>3</sup> Annual 2000 <sup>3</sup>	
109	BZ	900-109	Trench T-2 - Ryan's Pit	HRR <sup>1</sup>	Annual 1996 <sup>3</sup> Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
110	BZ	900-110	2000-2001 (2000-2001) (2000-2001) (2000-2001)		Annual 1997 <sup>3</sup> Annual 1998 <sup>3</sup> Annual 2000 <sup>3</sup>		
113	BZ	900-113	Mound Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
119 1	1	900-119 1	West Scrap Metal Storage Area and Solvent Spill (OU 1 CAD/ROD Specifies Continuance of Groundwater Collection from well (see ref # 20)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>	-	1999 <sup>27</sup>
119 2	1	900-119 2	East Scrap Metal Storage Area and Solvent Spill	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
130	1	900-130	Contaminated Soil Disposal Area East of Bldg 881	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
141	6	900-141	Sludge Disposal	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
153	IA	900-153	Oil Burn Pit No 2	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
154	IA	900-154	Pallet Burn Site	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
155	BZ	900-155	Triangle Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>3</sup> Annual 1999 <sup>23</sup> Annual 2000 <sup>23</sup>	-	-
165	6	900-165	South Dock - Building 991 (IAG Name Radioactive Site - 900 Area)	HRR <sup>1</sup>	-	-	-
173	IA	900-173	S&W Building 980 Container Storage Facility	HRR <sup>1</sup>	-	-	-
175	IA	900-175	S&W Contractor Storage Yard	HRR <sup>1</sup>	-	-	-
176	IA	900-176		HRR <sup>1</sup>	-	-	-

139

Appendix 1. IIRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
183	BZ	900-183	Gas Detoxification Area	HRR <sup>1</sup>	Annual 1997 Annual 2000 <sup>26</sup>	Annual 1997 <sup>1</sup> Annual 2000 <sup>26</sup>	
184	IA	900-184	Building 991 Steam Cleaning Area	HRR <sup>1</sup>	-	-	-
210	IA	900-210	Building 980 Cargo Container, Unit 16	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
213	IA	900-213	Unit 15, 904 Pad Ponderate Storage	HRR <sup>1</sup>	-	-	-
NA	IA	900-1300	RO Plant Sludge Drying Beds	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1301	Building 991 Enclosed Area	HRR <sup>1</sup>	-	-	-
NA	IA	900-1302	Gasoline Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1303	Natural Gas Leak	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1304	Chromic Acid Spill - Building 991	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1305	Building 991 Roof	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1306	Transformers 991-1 and 991-2	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1307	Explosive Bonding Pit	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup>
NA	IA	900-1308	Gasoline Spill Outside of Building 980	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	BZ	900-1309	OU 2 Field Treatability Unit Spill	Quarterly 6 <sup>16</sup>	Annual 1999 <sup>23</sup> Quarterly 8 <sup>15</sup>	-	-
NA	IA	900-1310	ITS Water Spill (identified as 000-502 in Quarterly 2, reassigned 900-1310 in Quarterly 7 <sup>9</sup> )	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup> (900-1312) Quarterly 8 <sup>15</sup> Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	2000 <sup>29</sup>
NA	IA	900-1310	ITS Water Spill (identified as 000-502 in Quarterly 2, reassigned 900-1310 in Quarterly 7 <sup>9</sup> )	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Quarterly 7 <sup>9</sup>	-	-
NA	IA	900-1310	ITS Water Spill (identified as 000-502 in Quarterly 2, reassigned 900-1310 in Quarterly 7 <sup>9</sup> )	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	-

140

Appendix 1 HRR Sites at RFETS							
IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	900-1312	OU-2 Water Spill	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	1999 <sup>29</sup>
192	IA	900-1313	Seep Area Near OU-2 Influent	Quarterly 9 <sup>13</sup>	Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	1999 <sup>29</sup>
101	IA	900-1314	Solar Evaporation Pond 207B Sludge Release	Quarterly 9 <sup>13</sup>	-	Quarterly 9 <sup>13</sup>	-
NA	IA	900-1315	Tanker Truck Release on East Patrol Road, North of Spruce Ave	Quarterly 10 <sup>11</sup>	Quarterly 11 <sup>18</sup>	Quarterly 11 <sup>18</sup>	-
NA	BZ	900-1316	Elevated Chromium (total) Identified During Geotechnical Drilling	Quarterly 10 <sup>11</sup>	-	Quarterly 10 <sup>11</sup>	-
176	IA	900-1317	Soil Released from Wooden Crate in 964 Laydown Yard	Quarterly 11 <sup>18</sup>	-	Quarterly 11 <sup>18</sup>	-
<p>OU 2 - 900-1318, 900-1319, 900-1320, 900-1321, 900-1322, 900-1323, 900-1324, 900-1325, 900-1326, 900-1327, 900-1328, 900-1329, 900-1330, 900-1331, 900-1332, 900-1333, 900-1334, 900-1335, 900-1336, 900-1337, 900-1338, 900-1339, 900-1340, 900-1341, 900-1342, 900-1343, 900-1344, 900-1345, 900-1346, 900-1347, 900-1348, 900-1349, 900-1350, 900-1351, 900-1352, 900-1353, 900-1354, 900-1355, 900-1356, 900-1357, 900-1358, 900-1359, 900-1360, 900-1361, 900-1362, 900-1363, 900-1364, 900-1365, 900-1366, 900-1367, 900-1368, 900-1369, 900-1370, 900-1371, 900-1372, 900-1373, 900-1374, 900-1375, 900-1376, 900-1377, 900-1378, 900-1379, 900-1380, 900-1381, 900-1382, 900-1383, 900-1384, 900-1385, 900-1386, 900-1387, 900-1388, 900-1389, 900-1390, 900-1391, 900-1392, 900-1393, 900-1394, 900-1395, 900-1396, 900-1397, 900-1398, 900-1399, 900-1400, 900-1401, 900-1402, 900-1403, 900-1404, 900-1405, 900-1406, 900-1407, 900-1408, 900-1409, 900-1410, 900-1411, 900-1412, 900-1413, 900-1414, 900-1415, 900-1416, 900-1417, 900-1418, 900-1419, 900-1420, 900-1421, 900-1422, 900-1423, 900-1424, 900-1425, 900-1426, 900-1427, 900-1428, 900-1429, 900-1430, 900-1431, 900-1432, 900-1433, 900-1434, 900-1435, 900-1436, 900-1437, 900-1438, 900-1439, 900-1440, 900-1441, 900-1442, 900-1443, 900-1444, 900-1445, 900-1446, 900-1447, 900-1448, 900-1449, 900-1450, 900-1451, 900-1452, 900-1453, 900-1454, 900-1455, 900-1456, 900-1457, 900-1458, 900-1459, 900-1460, 900-1461, 900-1462, 900-1463, 900-1464, 900-1465, 900-1466, 900-1467, 900-1468, 900-1469, 900-1470, 900-1471, 900-1472, 900-1473, 900-1474, 900-1475, 900-1476, 900-1477, 900-1478, 900-1479, 900-1480, 900-1481, 900-1482, 900-1483, 900-1484, 900-1485, 900-1486, 900-1487, 900-1488, 900-1489, 900-1490, 900-1491, 900-1492, 900-1493, 900-1494, 900-1495, 900-1496, 900-1497, 900-1498, 900-1499, 900-1500, 900-1501, 900-1502, 900-1503, 900-1504, 900-1505, 900-1506, 900-1507, 900-1508, 900-1509, 900-1510, 900-1511, 900-1512, 900-1513, 900-1514, 900-1515, 900-1516, 900-1517, 900-1518, 900-1519, 900-1520, 900-1521, 900-1522, 900-1523, 900-1524, 900-1525, 900-1526, 900-1527, 900-1528, 900-1529, 900-1530, 900-1531, 900-1532, 900-1533, 900-1534, 900-1535, 900-1536, 900-1537, 900-1538, 900-1539, 900-1540, 900-1541, 900-1542, 900-1543, 900-1544, 900-1545, 900-1546, 900-1547, 900-1548, 900-1549, 900-1550, 900-1551, 900-1552, 900-1553, 900-1554, 900-1555, 900-1556, 900-1557, 900-1558, 900-1559, 900-1560, 900-1561, 900-1562, 900-1563, 900-1564, 900-1565, 900-1566, 900-1567, 900-1568, 900-1569, 900-1570, 900-1571, 900-1572, 900-1573, 900-1574, 900-1575, 900-1576, 900-1577, 900-1578, 900-1579, 900-1580, 900-1581, 900-1582, 900-1583, 900-1584, 900-1585, 900-1586, 900-1587, 900-1588, 900-1589, 900-1590, 900-1591, 900-1592, 900-1593, 900-1594, 900-1595, 900-1596, 900-1597, 900-1598, 900-1599, 900-1600, 900-1601, 900-1602, 900-1603, 900-1604, 900-1605, 900-1606, 900-1607, 900-1608, 900-1609, 900-1610, 900-1611, 900-1612, 900-1613, 900-1614, 900-1615, 900-1616, 900-1617, 900-1618, 900-1619, 900-1620, 900-1621, 900-1622, 900-1623, 900-1624, 900-1625, 900-1626, 900-1627, 900-1628, 900-1629, 900-1630, 900-1631, 900-1632, 900-1633, 900-1634, 900-1635, 900-1636, 900-1637, 900-1638, 900-1639, 900-1640, 900-1641, 900-1642, 900-1643, 900-1644, 900-1645, 900-1646, 900-1647, 900-1</p>							

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	UBC-122	Building 122 (UBC-122)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-123	Building 123 (UBC-123)	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	-	-
NA	IA	UBC-125	Building 125 (UBC-125)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-331	Building 331 (UBC-331)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-371	Building 371 (UBC-371)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-374	Building 374 (UBC-374)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-439	Building 439 (UBC-439)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-440	Building 440 (UBC-440)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-441	Building 441 (UBC-441)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-442	Building 442 (UBC-442)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-444	Building 444 (UBC-444)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-447	Building 447 (UBC-447)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-528	Building 528 (UBC-528)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-559	Building 559 (UBC-559)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-701	Building 701 (UBC-701)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-707	Building 707 (UBC-707)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-731	Building 731 (UBC-731)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-770	Building 770 (UBC-770)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-771	Building 771 (UBC-771)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-774	Building 774 (UBC-774)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-776	Building 776 (UBC-776)	HRR <sup>1</sup>	-	-	-

142

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	UBC-777	Building 777 (UBC-777)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-778	Building 778 (UBC-778)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-779	Building 779 (UBC-779)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-865	Building 865 (UBC-865)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-881	Building 881 (UBC-881)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-883	Building 883 (UBC-883)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-886	Building 886 (UBC-886)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-887	Building 887 (UBC-887)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-889	Building 889 (UBC-889)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-991	Building 991 (UBC-991)	HRR <sup>1</sup>	-	-	-

- 1 *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June, 1992
- 2 *Annual Update for the Historical Release Report*, RF/ER-96-0046, Rocky Flats Environmental Technology Site, Golden, CO, September, 1996
- 3 *Annual Update for the Historical Release Report*, RF/RMRS-97-073 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1997
- 4 EPA, 1992 Correspondence to R Schassburger, DOE RFO, from M Hestmark, EPA Region VIII, RE Potential Area of Concern Needing Further Investigation, December 23
- 5 *Historical Release Report Second Quarterly Update*, October 1, 1992 to January 1, 1993
- 6 *Historical Release Report, Third Quarterly Update*, January 1, 1993 to April 1, 1993
- 7 *Annual Update for the Historical Release Report*, RF/RMRS-98-269 UN, Rocky Flats Environmental Technology Site, Golden, CO, September
- 8 *Historical Release Report, Fourth Quarterly Update*, April 1, 1993 to July 1, 1993
- 9 *Historical Release Report, Seventh Quarterly Update*, January 1, 1994 to March 31, 1994
- 10 *Historical Release Report, Fifth Quarterly Update*, July 1, 1993 to October 1, 1993
- 11 *Historical Release Report, Tenth Quarterly Update*, October 1, 1994 to December 31, 1994
- 12 *Corrective Action Decision/Record of Decision for OU16 Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO August, 1994
- 13 *Historical Release Report, Ninth Quarterly Update*, July 1, 1994 to September 30, 1994
- 14 *Operable Unit 11 Final Combined Phases RF/RI Report*, Rocky Flats Environmental Technology Site, Golden, CO, June, 1995
- 15 *Historical Release Report, Eighth Quarterly Update*, April 1, 1994 to June 30, 1994
- 16 *Historical Release Report, Sixth Quarterly Update*, October 1, 1993 to January 1, 1994
- 17 *Historical Release Report, Twelfth Quarterly Update*, April 1, 1995 to June 30, 1995
- 18 *Historical Release Report, Eleventh Quarterly Update*, January 1, 1995 to March 31, 1995
- 19 CDPHE, 1998, *Excavated Soil Adjacent to Building 701 (cc mail from C Spreng to L Brooks)*, Rocky Flats Environmental Technology Site, Golden, CO, July
- 20 *Corrective Action Decision/Record of Decision, Operable Unit 1 881 Hillside Area, IHSS 119 1*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, February, 1997
- 21 *Corrective Action Decision/Record of Decision for OU 15 Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August, 1995
- 22 *Final Corrective Action Decision/Record of Decision Declaration, Operable Unit 3*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July, 1997
- 23 *Annual Update for the Historical Release Report*, RF/RMRS-99-428 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1999
- 24 *Historical Release Report, First Quarterly Report submitted September 30, 1992*
- 25 KH, 2000, *Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999)*, Flats Environmental Technology Site, Golden, CO, September

26 Annual Update for the Historical Release Report, KH-00-900 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 2000  
27 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1997 Annual HRR Review, July 9, 1999  
28 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1998 Annual HRR Review, July 9, 1999  
29 EPA, CDPHE, 2000 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1999 Annual HRR Review, June 23, 2000

## **Appendix 2**

# **Correspondence**



Colorado Department  
of Public Health  
and Environment



July 9, 1999

Mr Joe Legare  
RFCA Coordinator  
Department of Energy-RFFO  
P O Box 928  
Golden CO 80402-0928

RE Annual Update for the Historical Release Report (September 1997)

Dear Mr Legare

The Colorado Department of Public Health and Environment (CDPHE) and the Environmental Protection Agency (EPA) have reviewed the 1997 Annual Update for the Historical Release Report. CDPHE and EPA are providing the attached comments and are also responding to recommendations for No Action or No Further Action (NFA) by categorizing each PAC/IHSS into three groups: 1 Concur with NFA, 2 More information required, and 3 Do not concur with NFA. To adequately justify NFA, each recommendation should include the specific criteria from RFCA Appendix 6 (as also described in the RFCA Implementation Guidance Document) which allow NFA to be proposed. If the justification is based on specific measurements or risk evaluations, then those values, exposure scenarios, etc. should be extracted from the original data source and summarized in text or tables. The adequacy of QA/QC that was performed on analyses should also be mentioned. In some cases, providing maps showing sampling locations would make a review of the narratives more complete and efficient.

1 The agencies concur with the recommendation for NFA for the following PACs/IHSSs

300-715	400-191	800-107
700-1115	600-117 3	800-145
NE-111 1	600-152	800-147 2
NE-156 2	800-102	900-113
NE-167	800-103	900-119 1
SE-209	800-104	900-119 2
300-135	800-105 1	900-130
300-151	800-105 2	900-141
300-181	800-106	900-210
300-188		

2 The agencies require more information to be able to approve NFA for the following PACs/IHSSs


900-1307	SW-133 6	600-189
NE-110	SW-1701	600-1001
NE-216 2	300-156 1	700-123 1
NE-216 3	600-164 1	700-1102
SW-133 5		

3 The agencies do not concur with the recommendation for NFA for the following PACs/IHSSs

NE-142 1	NE-142 6	SE-142 10
NE-142 2	NE-142 7	SE-142 11
NE-142 3	NE-142 8	900-183
NE-142 4	NE-142 9	900-109
NE-142 5		

If you have any questions concerning these comments please contact Carl Spreng at 303-692-3358 or Gary Kleeman at 303-312-6246

Sincerely,

  
Steven H. Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment

  
Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

cc Norma Casteñeda, DOE  
Laura Brooks, K-H  
Nick Demos, RMRS  
Dan Miller, AGO  
Steve Tarlton, CDPHE-RFOU  
Susan Chaki, CDPHE

**Colorado Department of Public Health and Environment  
Hazardous Materials and Waste Management Division  
and  
Environmental Protection Agency**

comments on

**Annual Update for the Historical Release Report  
September 1997 (Rev 0)  
(RF/RMRS-97-073.UN)**

---

1. PAC 300-715  
This narrative should identify the specific NFA criteria used to justify the NFA recommendation. In this case, a source evaluation was conducted, which indicated that no current or potential source exists.
2. PAC 700-1114  
The NFA recommendation should specify that sampling indicates no current or potential source exists.
3. PAC 700-1115  
The "RFCA UST cleanup thresholds" mentioned on page 12 should be identified.
4. PAC 900-1307  
The phrase "so that no current or potential source exists" should be added to the NFA recommendation. A summary of the analytical results (chemical and radiological) which confirmed the removal of contaminated soil must be included.
5. PAC NE-110 (IHSS 110)  
The Physical/Chemical Description of Constituents Released section on page 17 describes conditions and level of knowledge prior to the remedial action. It should be updated based on knowledge gained from taking the action.  
  
The "black material" mentioned in the second paragraph on page 18 should be identified as depleted uranium.  
  
The statement on page 18 that, "disposal of the 2,400 gallons of water and lathe coolant from Building 444 occurred in another trench and not T-3" should be documented and considered in determining the Environmental Restoration rankings for the remaining East Trenches.  
  
The justification for NFA should be that remaining contaminant levels are below action levels. However, the stated action levels ("cleanup values") have recently been modified as a part of the annual review process. The Tier I action levels for carbon tetrachloride

and tetrachloroethene (PCE) are 3.56 mg/kg and 3.15 mg/kg respectively. Therefore, one of the verification samples for PCE exceeds the Tier I action level and all three detections for PCE and the one for carbon tetrachloride exceed the Tier II action level. The text should be revised to state that, "These cleanup values were also consistent." Leaving levels above Tier II action levels requires an explanation of how these levels are not expected to cause surface water to exceed standards. This explanation can refer to the condition in the PAM that source removal in the trench would be considered complete if verification samples were below cleanup levels or upon reaching groundwater or bedrock. The rationale for this condition was that any remaining contamination beyond these criteria would be subject to groundwater remediation.

The first statement in the Comments section should be revised to state, "Trenches T-1 through T-13."

6 PAC-111.1 (IHSS 111.1)

The last sentence on page 21 should be revised to state that, "A letter to EPA."

The 2,400 gallons of water and lathe coolant from Building 444, which are mentioned on page 20 as being disposed of in one of the East Trenches, has not been found in any of the trenches excavated so far. This should be considered when determining the Environmental Restoration rankings for the remaining East Trenches.

The justification for NFA should be that remaining contaminant levels in subsurface soil are below action levels. However, the stated action levels ("cleanup values") have recently been modified as a part of the annual review process. The Tier I action levels for trichloroethene (TCE) and tetrachloroethene (PCE) are 3.28 mg/kg and 3.15 mg/kg respectively. Therefore, the trench bottom verification samples exceed the Tier I action level for TCE or PCE in primary grids 26, 29, 30, and 32. All detections above quantitation limits exceed Tier II action levels. The text should be revised to state that, "The cleanup values stipulated in the PAM (DOE, 1996c) were also consistent." The agreement among the agencies concludes that the conditions for source removal in the PAM had been met once bedrock or groundwater was reached. The rationale for this condition was that any remaining contamination beyond these criteria would be subject to groundwater remediation. The changes to action levels does not affect the agreement among the agencies.

The approval of this NFA recommendation may need to be reviewed if radionuclide soil action levels are revised in the future.

7 PACs NE-142.1, NE-142.2, NE-142.3, & 142.4 (IHSSs 142.1, 142.2, 142.3, & 142.4)

Since this series of ponds serve as contaminant sinks and will continue to receive contaminants from the Site, particularly during continuing D&D and LR activities, it is premature to consider them for NFA. In addition, there is uncertainty about how the ponds will be used/managed in the future.

150

Instead of mentioning "low levels of radioactivity" on page 29, specific activity levels should be stated. On page 32, the "current and future onsite receptors" should be specified. The statement on page 33 that indicates that the OU 6 CAD/ROD is being prepared can be deleted.

- 8 PACs NE-142.5, NE-142.6, NE-142.7, NE-142.8 & 142.9 (IHSSs 142.5, 142.6, 142.7, NE-142.8 & 142.9)

Since this series of ponds will continue to receive contaminants from the Site, particularly during continuing D&D and ER activities, it is premature to consider them for NFA. It is also uncertain as to how the ponds will be managed in the future.

On page 39, the "current and future onsite receptors" should be specified. The statement on page 40 that indicates that the OU 6 CAD/ROD is being prepared can be deleted.

- 9 PAC NE-156.2 (IHSS 156.2)

The NFA justification should be that the AOC that included this PAC has passed the CDPHE conservative screen.

- 10 PAC NE-167.1 (IHSS 167.1)

The discussion on page 46 concerning the risk evaluation should identify the one current and four future receptors referred to by the statement, "all current and future onsite receptors." In Table 3, the units for two of the contaminants are expressed in units of volume rather than in units of mass as is usual.

- 11 PACs NE-216.2 & NE-216.3 (IHSSs 216.2 & 216.3)

The text on page 50 discussing NFA justification must be more specific. The statement that contamination associated with these IHSSs poses "no significant risk" is inadequate. The "remediation goals" to which the chromium concentrations were compared must be identified. If these goals are the PPRGs, the most recently revised PPRGs should be reviewed. The text should also report the measured radionuclide activity levels which support the statement that the surface soils are below levels which would produce a 15 mrem/year dose to an open space user. The 15 mrem/year dose to an open space user was not established as a Tier I action level since it is an order of magnitude greater than the 85 mrem dose to a resident. Therefore, the significance of comparing to that level is unclear and does not constitute grounds for NFA.

- 12 PACs NE-142.10 & NE-142.11 (IHSSs 142.10 & 142.11)

Since this series of ponds serve as contaminant sinks and will continue to receive contaminants from the Site, particularly during continuing D&D and ER activities, it is premature to consider them for NFA. In addition, there is uncertainty about how the ponds will be used/managed in the future.

The "SE" prefix should be removed from the IHSS Reference Numbers on page 51. The "low levels of radioactivity" mentioned on page 52 should be specified. On page 53, the "current and future onsite receptors" should be identified.

- 13     PAC SE-209 (IHSS 209)  
The boundary for this IHSS does not contain the entire disturbed area evident on aerial photographs
- 14     PAC SE-133.5 (IHSS 133.5)  
The discussion of the recommendation for NFA on page 59 should identify the "contaminants associated with the incinerator facility" The text should also report the measured radionuclide activity levels which support the statement that the surface soils are below levels which would produce a 15 mrem/year dose to an open space user The 15 mrem/year dose to an open space user was not established as a Tier I action level since it is an order of magnitude greater than the 85 mrem dose to a resident. Therefore, the significance of comparing to that level is unclear and does not constitute grounds for NFA
- 15     PAC SE-133.6 (IHSS 133.6)  
On page 59, the discussion of the recommendation for NFA should identify the "contaminants associated with the Concrete Wash Pad" The text should also report the measured radionuclide activity levels which support the statement that the surface soils are below levels which would produce a 15 mrem/year dose to an open space user The 15 mrem/year dose to an open space user was not established as a Tier I action level since it is an order of magnitude greater than the 85 mrem dose to a resident Therefore, the significance of comparing to that level is unclear and does not constitute grounds for NFA
- 16     PAC SW-1701 (IHSS 1701)  
In the discussion of the recommendation for NFA on page 63, the "contaminants associated with the suspected ash pit finding" should be identified. The text should also report the measured radionuclide activity levels which support the statement that the surface soils are below levels which would produce a 15 mrem/year dose to an open space user The 15 mrem/year dose to an open space user was not established as a Tier I action level since it is an order of magnitude greater than the 85 mrem dose to a resident Therefore, the significance of comparing to that level is unclear and does not constitute grounds for NFA
- 17     PAC 300-151 (IHSS 151)  
Since sampling indicates no current source exists, that is the NFA criterion that applies
- 18     PAC 300-156.1 (IHSS 156.1)  
The justification for NFA cannot be based on "All analytical data were below PRGs" This fact may allow for NFA justification based on a comparison to action levels (PPRG values are used as action levels for surface soil and for inorganics in subsurface soil), or through a risk evaluation This section recommending NFA should include a summary of the analytical data which shows, by comparison to action levels or through a risk evaluation, that a NFA criterion is met

- 19 PAC 400-191 (IHSS 191)  
The "exposure conditions" used to evaluate the "threat of adverse health effects" should be provided
- 20 PACs 600-117.3 & 600-152 (IHSSs 117.3 & 152)  
The presumed disposal of contaminated asphalt in the East Trenches should be noted for Environmental Restoration Ranking
- 21 PAC 600-164.1 (IHSS 164.1)  
The statement on page 90 that "there were no detections above PRGs" does not specify either the values of the detections or the exposure scenario of the PRGs. This IHSS will likely qualify for one or more of the NFA criteria once this information is provided.
- 22 PAC 600-189 (IHSS 189)  
Since the location and quantities of acid releases are not documented, it is implausible to state on page 93 that "small amounts of acid spilled." The evidence and basis for proposing that the cumulative hazard indices for noncarcinogenic health effects are less than or equal to precisely 0.01 are also unclear. Neutralization may well have rendered the acid harmless and a few pH verification measurements would be relatively inexpensive and could support an NFA based on the lack of a current source.
- 23 PAC 600-1001  
The agencies concur that the source of the June 23, 1997 occurrence no longer exists and that this portion therefore qualifies for NFA. The rest of this PAC requires further investigation, as stated.
- 24 PAC 700-123.1 (IHSS 123.1)  
The statement on page 100 that, "No threat of adverse health effects exist under the exposure conditions evaluated" leaves the exposure scenario applied unspecified. The referenced OU 8 Data Summary Report is unavailable in the State records. If this report indicates that essentially no contamination remained when this IHSS was sampled, then the relevant NFA criterion is that no current source exists.
- 25 PAC 700-1102  
The updated subsurface soil action levels for Araclor 1260 are 5.31 mg/kg (Tier II) and 531 mg/kg (Tier I). Since the 70 ppm left in the subsurface exceeds the Tier II limit, an evaluation is required to determine if this level is protective of surface water and ecological resources.
- 26 PAC 800-147.2 (IHSS 147.2)  
The applicable criterion for no action is that sampling indicates that no source exists or that measured contaminant levels are below action levels for the appropriate medium.
- 27 PAC 900-109 (IHSS 109)  
The thermal desorption unit performance standards referenced in the NFA recommendation

are not a NFA criterion. Neither are the PPRGs for a construction worker scenario, which are referenced in the Closeout Report for this IHSS. Analytical results of confirmation samples along the south wall of the trench exceed current Tier II action levels for several VOCs: PCE, TCE, toluene, and ethylbenzene. This exceedance requires an evaluation of the impacts of these remaining contaminants on surface water and ecological resources. The south wall confirmation samples also exceed the Tier I action levels for PCE and TCE. This IHSS cannot, therefore, be considered for NFA.

28 PAC 900-113 (IHSS 113)

The justification for NFA needs to additionally state that by meeting the PAM objectives, specific NFA criteria were also met. At the top of page 135, IHSS 113 is referred to as PAC NE-113 rather than PAC 900-113.

29 PAC 900-130 (IHSS 130)

The northing for the approximate location should apparently be N748,000 rather than N746,000. In three instances in the text, this IHSS is referred to as PAC 800-130 rather than PAC 900-130 as in the title and in the Table of Contents. The meaning and relevance of the second sentence at the top of page 145 is unclear, particularly its reference to PAC 800-145.

30 PAC 900-141 (IHSS 141)

The statement on page 147 that, "In June 1973, air samples were unusually high" is vague and should specify the contaminant and the measurement. The HHRA results indicate that the AOC which includes IHSS 141 would pass a risk evaluation and the CDPHE Conservative Screen. This should be stated as the NFA justification. This discussion should also mention which specific current and future onsite receptors the HHRA assessed. The Comment section mentions that the PAC boundary was extended to include the area of the sludge drying beds. This seems to be in contrast to the Fate of Constituents Released to Environment section which states that this area is being investigated as a separate action.

31 PAC 900-183 (IHSS 183)

One nearby borehole is not sufficient to characterize this building which contained toxic gases. This IHSS should be treated similarly to other IHSSs associated with buildings. Once the 903 Lip Area remediation allows access and the building is down, the slab can be tested (e.g., rinsate sampling or chips). If warranted by these tests, additional soil samples adjacent to or under the slab can be analyzed.

32 PAC 900-210 (IHSS 210)

"No positive detections" indicates that the appropriate no action justification for this IHSS is that no current or potential source could be found.



Colorado Department  
of Public Health  
and Environment



July 9, 1999

Mr. Joe Legare  
RFCA Coordinator  
Department of Energy-RFFO  
P O Box 928  
Golden CO 80402-0928

RE Annual Update for the Historical Release Report (September 1998)

Dear Mr Legare

The Colorado Department of Public Health and Environment (CDPHE) and the Environmental Protection Agency (EPA) have reviewed the 1998 Annual Update for the Historical Release Report. CDPHE and EPA are providing the attached comments and are also responding to recommendations for No Action or No Further Action (NFA) by categorizing each PAC/IHSS into three groups 1 Concur with NFA, 2 More information required, and 3 Do not concur with NFA To adequately justify NFA, each recommendation should include the specific criteria from RFCA Appendix 6 (as also described in the RFCA Implementation Guidance Document) which allow NFA to be proposed If the justification is based on specific measurements or risk evaluations, then those values, exposure scenarios, etc should be extracted from the original data source and summarized in text or tables The adequacy of QA/QC that was performed on analyses should also be mentioned In some cases, providing maps showing sampling locations would make a review of the narratives more complete and efficient

1 The agencies concur with the recommendation for NFA for the following PACs/IHSSs

700-1117	NW-203	400-800
NE-1405	NW-1500	400-811
NE-1406	000-172	700-150 5
NW-174B	100-608	

155

2 The agencies require more information to be able to approve NFA for the following PACs/IHSSs

NW-170  
500-169

NE-1404

900-1318

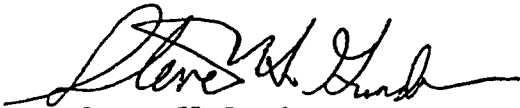
3 The agencies do not concur with the recommendation for NFA for the following PAC/IHSS.

NW-174A

900-140

If you have any questions concerning these comments, please contact Carl Spreng at 303-692-3358 or Gary Kleeman at 303-312-6246

Sincerely,



Steven H. Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment



Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

cc Norma Casteñeda, DOE  
Laura Brooks, K-H  
Nick Demos, RMRS  
Dan Miller, AGO  
Steve Tarlton, CHPHE-RFOU  
Susan Chaki, CDPHE

**Colorado Department of Public Health and Environment  
Hazardous Materials and Waste Management Division  
and  
Environmental Protection Agency**

comments on

**Annual Update for the Historical Release Report  
September 1998 (Rev. 0)  
(RF/RMRS-98-269.UN)**

---

- 1     PAC 700-1117  
The NFA criterion is that analytical results for all contaminants are below Tier II action levels
  
- 2     PAC NE-1404  
Analytical data are described in the text as being from the excavated soil. The data sheet, however, indicates a water matrix. BTEX and TPH analyses should be performed on the remaining soil to confirm the assumption that no source remains.
  
- 3     PAC NW-170 (IHSS 170)  
A review of this narrative suffers from a lack of primary data available to the agencies. The referenced Data Summary Report (RMRS, 1997) is not in the CDPHE records and presumably was not submitted to the State or to EPA. The "internal investigation report" that was generated following the "unknown powder incident" in 1987 is also not available.

While the soil-gas survey reported in Technical Memorandum 1 detected acetone, benzene, methane, tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene, the analytical results for subsurface soil in Table 1 of this narrative reports analyses for only methylene chloride and naphthalene. The last sentence of the first paragraph on page 27 is unclear since the Tier I action level for naphthalene in subsurface soil is  $1.01 \times 10^4$  mg/kg. It is expected that the detected amounts of trichlorotrifluoroethane are below hazardous levels. Slope factors for this compound are not available in sources used for PPRG calculations (IRIS, HEAST, etc.)

The NFA recommendation states that VOC concentrations in subsurface soil are below Tier I action levels. The 1997 Data Summary Report needs to be provided so that the subsurface soil concentrations can be checked against the new Tier II subsurface soil action levels. The NFA recommendation can also mention that the analytical results for surface soil reported in Technical Memorandum 1 are all below Tier II action levels for surface soil. Once the above-mentioned data has been provided for review, it is expected that this IHSS can be approved for no further action.

4 PAC NW-174A and NW-174B (IHSS 174)

The referenced Data Summary Report (RMRS, 1997) is not in the CDPHE records and presumably was not submitted to the State or EPA. The action levels mentioned in the discussion of the results of this report have been revised. The PCE concentration in Borehole 17497 exceeds the new Tier I subsurface soil action level of 3,150 µg/kg which triggers a removal action. The groundwater in this same borehole exceeds the Tier I PCE action level, so that the necessity of an action to protect surface water must be evaluated. The TCE subsurface soil concentration in Borehole 18997 exceeds the new Tier II action level of 32.8 µg/kg which likewise requires an evaluation of impacts to surface water.

Particularly since the Draft Summary Report is unavailable, the isotopic results for the surface soil analyses, as well as the background values against which they were measured, should be included in the narrative. In spite of "administrative controls to prevent radioactively contaminated material from being shipped to the yard," the "unknown powder incident" described in the IHSS 170 narrative occurred in 1987. External radiation monitoring did not prevent storage of radioactively-contaminated materials with at least moderate activity levels.

The exceedances of Tier I subsurface soil and groundwater action levels at IHSS 174A precludes a NFA recommendation. The agencies can consider the NFA recommendation for IHSS 174B once the 1997 Draft Summary Report is provided.

5 PAC NW-203 (IHSS 203)

The surface soil action levels for cobalt, copper, vanadium, Aroclor 1254, and Aroclor 1260 listed in Table 1 on page 38 have been modified slightly as part of the PPRG annual review process. The reported analytical results are still well below the revised action levels.

6 PAC 000-172 (IHSS 172)

The referenced OU 8 Data Summary (DOE, 1995) is not in the CDPHE records and presumably was not submitted to the State. In Table 1, the correct Tier II surface soil action level for benzo(a)pyrene is 0.784 mg/kg.

7 PAC 100-608

The criterion for NFA should be that no current or potential source in soils has been detected.

8 PAC 400-800

The cleanup levels in TSCA guidance are not established as NFA criteria. The criterion for NFA should be that the PCB concentrations are all below Tier II action levels.

9 PAC 400-811

The cleanup levels in TSCA guidance are not established as NFA criteria. The criterion for NFA should be that the PCB concentrations are all well below Tier I action levels. All PCB analyses, with the exception of Aroclor 1248, are below Tier II action levels as

158

well The highest Araclor 1248 concentration is barely above that action level so no action is required

10 PAC 500-169 (IHSS 169)

The agencies concur that it is reasonable to conclude that no current or potential threat exists due to the possible spill of hydrogen peroxide. However, information in this narrative alluding to a buried drum suggests that other drums, possibly with more hazardous constituents, may have been buried in the area. Before potential drum burial sites such as the chemical storage yard are considered for NFA, characterization activities should include attempts to locate buried drums. The referenced OU 13 documents indicate that no efforts to locate potentially buried drums were conducted or proposed.

11 PAC 900-140 (IHSS 140)

The list of metal COCs does not correspond with the list of metallic compounds and residues known to have been buried at this site. Possible conclusions are that boreholes were not suitably located or that the list of metals handled at the site is incomplete. Sampling in IHSS 140 appears to have occurred around the periphery rather than in the middle of the IHSS raising concerns that contamination may have been missed. Several of the isoconcentration maps in the OU 2 report appear to indicate a source in IHSS 140 for several contaminants seen in the Alluvial/Colluvial UHSU flow system.

The phrase, "in  $\mu\text{g/Kg}$ ", should be deleted from the heading for Table 1 on page 86 since this differs from the units given in the table itself. This table should show that, according to the OU 2 RFI/RI Report, carbon tetrachloride, cis-1,3-dichloropropene, methylene chloride, tetrachloroethene, and trichloroethene exceed the new Tier II action levels for subsurface soil. The reported range of values for arsenic exceeds the Tier II action level for open space use. The collection of composite samples, rather than discrete samples, in the boreholes (over a 6-foot interval for all but the VOC analyses), which may have diluted the levels of contamination, is also a concern.

12 PAC 900-1318

The phrase "so that no current or potential source exists" should be added to the NFA recommendation. A summary of the analytical results (chemical and radiological) which confirmed the removal of contaminated soil must be included.



Colorado Department  
of Public Health  
and Environment



June 23, 2000

Mr Joe Legare  
Assistant Manager for Environment  
and Infrastructure  
Department of Energy-RFFO  
P O Box 928  
Golden CO 80402-0928

RE Annual Update for the Historical Release Report (September 1999)

Dear Mr Legare

The Colorado Department of Public Health and Environment (CDPHE) and the Environmental Protection Agency (EPA) have reviewed the 1999 Annual Update for the Historical Release Report. This report proposes three new PACs, updates existing IHSSs/PACs with additional information including the results of characterization and remediation activities, and makes recommendations for No Further Action (NFA). The agencies concur with the recommendations for NFA for the following PACs/IHSSs:

900-1309	900-1312	900-1313	NW-74B
NW-1501	NE-1408		

The agencies need further information, as explained in the attached comments, to be able to concur with the recommendation for NFA for the following PACs/IHSSs:

NE-1409	NW-170	900-1311
---------	--------	----------

If you have any questions concerning these comments, please contact Carl Spreng at 303-692-3338 or Gary Kleeman at 303-312-6246.

Sincerely,

Steven H. Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment

Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

cc Norma Casteñeda, DOE  
Laura Brooks, K-H  
Nick Demos, RMRS

Dan Miller, AGO  
Steve Tarlton, CHPHE-RI OU  
Susan Chaki, CDPHE

160

**Colorado Department of Public Health and Environment  
Hazardous Materials and Waste Management Division**

comments on

**Annual Update for the Historical Release Report  
September 1999  
(RF/RMRS-99-428.UN)**

---

1 PAC #000-504 (New Process Waste Lines)

This PAC identifies 3 documented releases from the NPWL and 4 potential waste streams in overlapping OPWL and NPWL. It is understood that the releases identified in this update may not be all of the possible releases that have occurred.

2 PAC #000-505 (Storm Drains)

This PAC identifies several releases/discharges into the storm drains associated with specific buildings. Again, it is understood that these may not be the only areas of concern for this PAC

3 PAC SE-1602 (East Firing Range)

The two possible contaminants identified for this PAC are lead and depleted uranium. Additional information needs to be provided regarding other activities that may have been conducted at the range. These are:

- Were weapons cleaned at the east firing range? If so, or if this can not be determined, then solvents may need to be included as possible contaminants of concern.
- Was there any shell reloading or management of the propellant/explosives at this site? If so, or if this can not be determined, then explosives and other metals associated with the propellants may need to be included as possible contaminants of concern.
- Possible radiological concerns due to contaminant contribution from other sources, such as the 903 Pad need to be considered, since the presence of these contaminants may cause interference and safety concerns during the investigation of the East Firing Range.

4 PAC NE-1408 (OU2 Test Well)

- The appropriate values to compare to the detections listed in Table 3.2 are the Tier II Groundwater Action Levels. The basis for the "Regulatory Limits" listed in the right-hand column is unclear.

5 PAC NE-1409 (Interceptor Trench Pump House)

In Table 3.5, the superscripted "2" on the mean for the cadmium results should probably be a "3". The appropriate values to compare to the detections listed in this table are the surface water standards. The reported mean values for cadmium, silver, carbon tetrachloride, tetrachloroethene, trichloroethene, and cyanide exceed those standards. Neither this table nor the text locate this sampling station in relation to the PAC or explain the relationship of the analyses to the PAC.

1161

In Table 3 7, the correct values for the Surface Soil Tier I and Tier II Action Levels for methylene chloride are 7 63E+02 and 7 63E+04 respectively

6 PAC NW-170 (PU&D Storage Yard)

The levels of methylene chloride reported in Table 3 9 indicate an analytical system problem and even a potential risk to lab workers in some cases. The significantly higher results for Boreholes #17797 and #18197 cannot be explained away as lab contamination.

The recommendation for NFA on page 42 ignores the Subsurface Soil Tier II Action Level, the level at which contamination may leach into groundwater at levels which could impact surface water above the standards. The statement that, "IHSS 170 poses no threat to either surface water or ground water, and therefore, is proposed for NFA" is not justified by the text. An acceptable justification could include some of the information in the last paragraph in this section, which explains that a VOC plume has been identified and is being monitored under the Integrated Water Management Plan.

7 PAC NW-174A (Drum Storage Facility)

The recently proposed geostatistical sampling methods could be applied to the detections of beryllium and vanadium to predict if and where additional sampling may be necessary.

There is inadequate data to support the assertion that the contamination in IHSS 174A has stabilized as stated on page 54. BH17497 was not completed as a well nor included in the IMP, therefore, there is no trend data indicating the source to ground water is stable. Please refer to CDPHE comments in correspondence on February 7, 2000.

8. PAC 900-108 (Trench T-1)

The disposition of Trench 1 waste was part of the original milestone for this removal project. Page 65 of this update states that this waste will remain in interim storage until an appropriate treatment process can be identified. The status of this search for a treatment process should be reported, either in the next annual HRR update or in separate correspondence.

9 PAC 900-1311 (Septic Tank East of Building 991)

Attempts should be made to calculate appropriate action levels for those contaminants lacking one, rather than compare concentrations to Region 3 values, which are based on ingestion only. Alternative references for physical parameters (subsurface soil) and slope factors or toxicity factors (surface soil) could be used. Since these contaminants have been detected in the environment at RFETS, these newly calculated action levels should be added to the RFCA Attachment 5 tables.

## **Appendix 3**

### **Areas of (Non RFCA) Soil Put-back**

## **Appendix 4**

### **Plates**

145

**THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS  
DOCUMENT**

**Final Update to the Historical  
Release Report, August 1, 1999  
through August 1, 2000**

**Plate 1:  
Individual Hazardous  
Substance Sites by  
Consolidated Operable Unit**

**Map ID: 2k-0373**

**September 26, 2000**

**CERCLA Administrative Record document, SW - A - 004150**

**U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**GOLDEN, COLORADO**

146

**THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS  
DOCUMENT**

**Final Update to the Historical  
Release Report, August 1, 1999  
through August 1, 2000**

**Plate 2:**

**No Further Action  
Individual Hazardous  
Substance Sites and Potential  
Areas of Concern**

**Map ID: 2k-0373**

**September 26, 2000**

**CERCLA Administrative Record document, SW - A - 004150**

**U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**GOLDEN, COLORADO**

167

**THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS  
DOCUMENT**

**Final Update to the Historical  
Release Report, August 1, 1999  
through August 1, 2000**

**Plate 3  
Historical Release Report Original  
Process Waste Lines and New  
Process Waste Line**

**Map ID: 2k-0373**

**September 26, 2000**

**CERCLA Administrative Record document, SW - A - 004150**

**U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**GOLDEN, COLORADO**

**THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS  
DOCUMENT**

**Final Update to the Historical  
Release Report, August 1, 1999  
through August 1, 2000**

**Plate 4**

**Potential Areas of Concern and  
Under Building Contamination Sites**

**Map ID: 2k-0373**

**September 26, 2000**

**CERCLA Administrative Record document, SW - A - 004150**

**U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**GOLDEN, COLORADO**

169/169

Figure 1.1  
Historical Release Report  
PAC Area Boundaries

EXPLANATION  
PAC Area Designation Boundary

- Standard Map Features
- Buildings and other structures
  - Sole Evaporation Ponds (SEPs)
  - Rocky Flats boundary
  - Paved roads

**DATA SOURCES AND ASSURANCE**  
Data were derived from historical maps and other sources from 1904 to 1990. The data were digitized by ESRI's GIS, Inc. The data were digitized from the orthophotographic 1981 data source.  
Potential Area of Concern (PAC)  
Approved by West Domes (WDRS, 201-006-4005)

**NOTE**  
PAC A was with 000 feet. Use as AC 000. 2 Original Price. Water Lines. Not the PAC boundary line and no how. Not Figure. PAC A was with OFFSITE. Not as OFFSITE. 1985-98 200 20 and 202 (Operational Unit 21) in two towns. Not Figure. Not as scale.



Scale 1:20450  
1 inch represents approximately 1704 feet



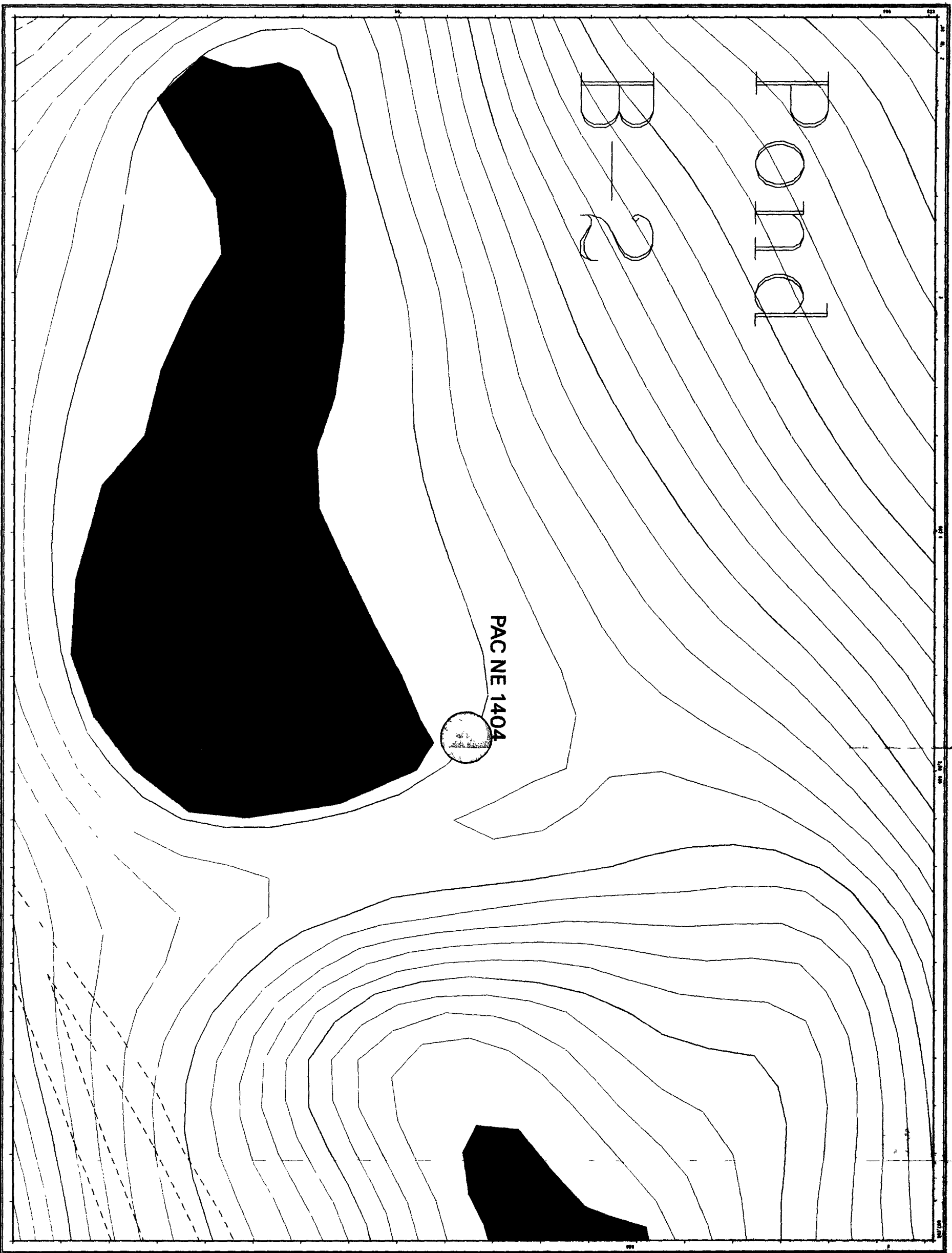
State Plans Co. reprint. Protection  
Colorado Cart. 1/2  
Det. m. NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
**DynCorp**



MAP ID: 24-0373pac.bdy.aml  
September 25, 2000



**Figure 2.1**

**Historical Release Report**

**Potential Area of Concern**

**PAC NE-1404**

### EXPLANATION

天正九年

## Standard Map Features

- ▀ Lakes and ponds
- ▀ Rivers, ditches or other drainage features
- ▀ Fences and other barriers
- ▀ Contour (2-foot)
- ▀ Paved roads
- ▀ Dirt roads

[illegible]

**NOTE:** All HHS and POC boundaries are Approximate. For more detail please contact NID Darrin O'Leary for the following document:  
Historical Release Report #HHS September 2000 Annual Update

U.S. Department of Energy

## Rocky Flats Environmental Technology Site

015 Dept. 203-663-77

Prepared by Prepared for

**DynCorp**



**KAISER HILL**

**KAISER HILL**



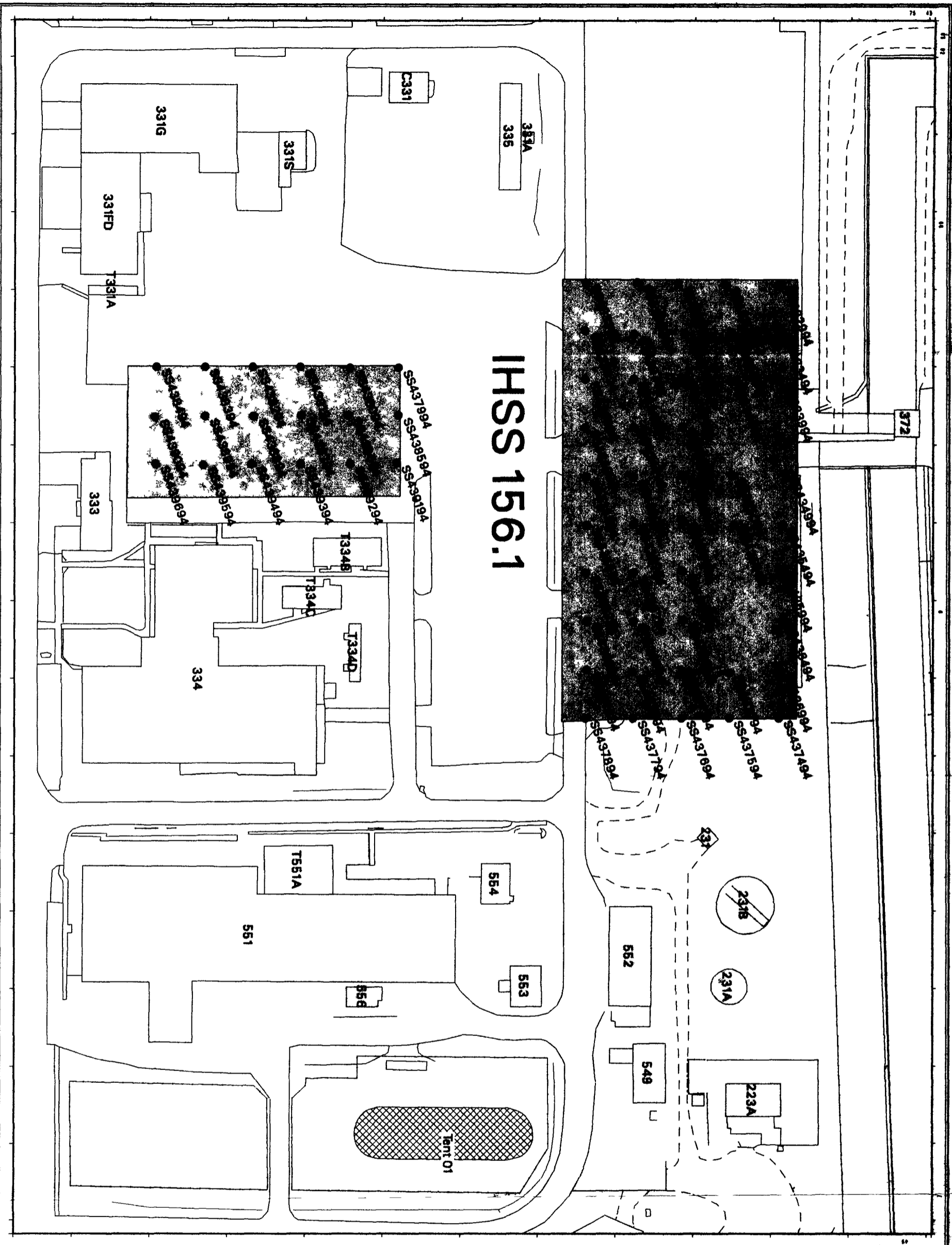


Figure 2.3  
Historical Release Report  
IHSS 300-156.1  
Surface-Soil Sample Locations

EXPLANATION

- Surface-Soil Sample Location



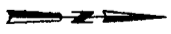
IHSS 156.1

Standard Map Features

- Building and other structures
- ▨ Narrowed Building
- Stream, dike, or other drainage feature
- - - Fence and other barriers
- == Paved roads
- Dirt roads

DATA SOURCES: Aerial photographs, maps, and other information from 1960 to 1990 were used to create this map. The map was prepared by E&G RSL, Inc. using data derived from the orthophotograph, 1965.

Data Source:  
Surface Soil data: Approved by  
Surface Soil data: Approved by  
With Chemical (MMS), 303-955-45351.  
Individual Hazardous Substance Site (IHSS)  
Approved by Nick Dennis (MMS), 303-955-40051.



Scale 1" = 1220 feet  
1 inch per cent approximated by 102 feet

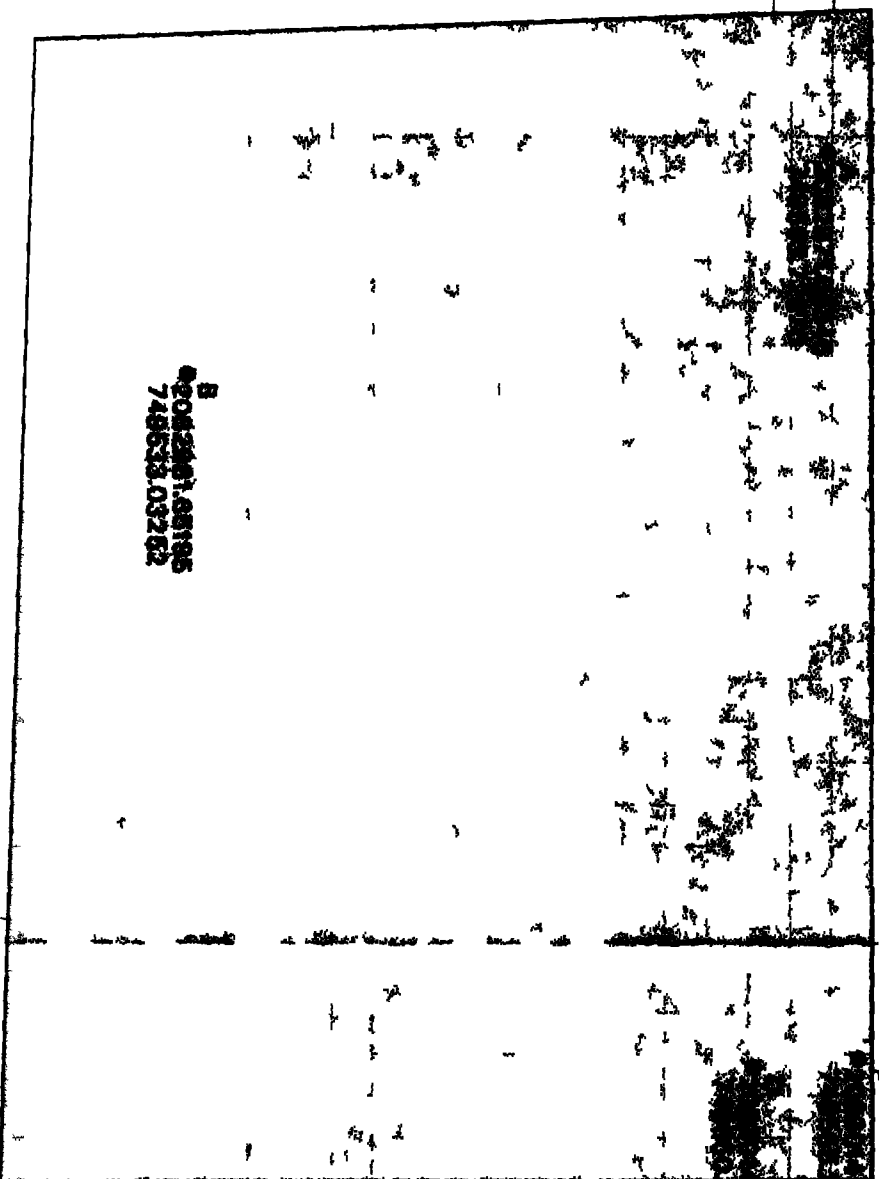


State Plane Co. dines Projectio  
Colorado Cent al Zone  
Datum NAD27

U S Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
**DynCorp**  
Prepared to  
**Kaiser Hill**

IHSS 169



87382  
8269  
87382  
8269

Figure 2.4

Historical Release Report

GPR Study  
June 25, 2000

IHSS 500-169

EXPLANATION

- Anomaly identified with Stereophore Coordinate

IHSS 169

Grid 2 21

Standard Map Features

- Fence and other barriers
- == Fenced road

DATA SOURCE: Aerial Photographs

Aerial photographs were made and flown at locations from 1964 until the early 1970s. The photographs were digitized from the original aerial photographs.

All IHSS and PAC's boundaries are approximate. For more detail, please contact West D. Jones (240) 661-1111 or the following document:  
// Internal Release Report #1/198 Sep 1986 2000 Annual Update



Scale 1:110  
1 inch represents approximately 110 feet



State Plane Coordinate System  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by

**DynCorp**

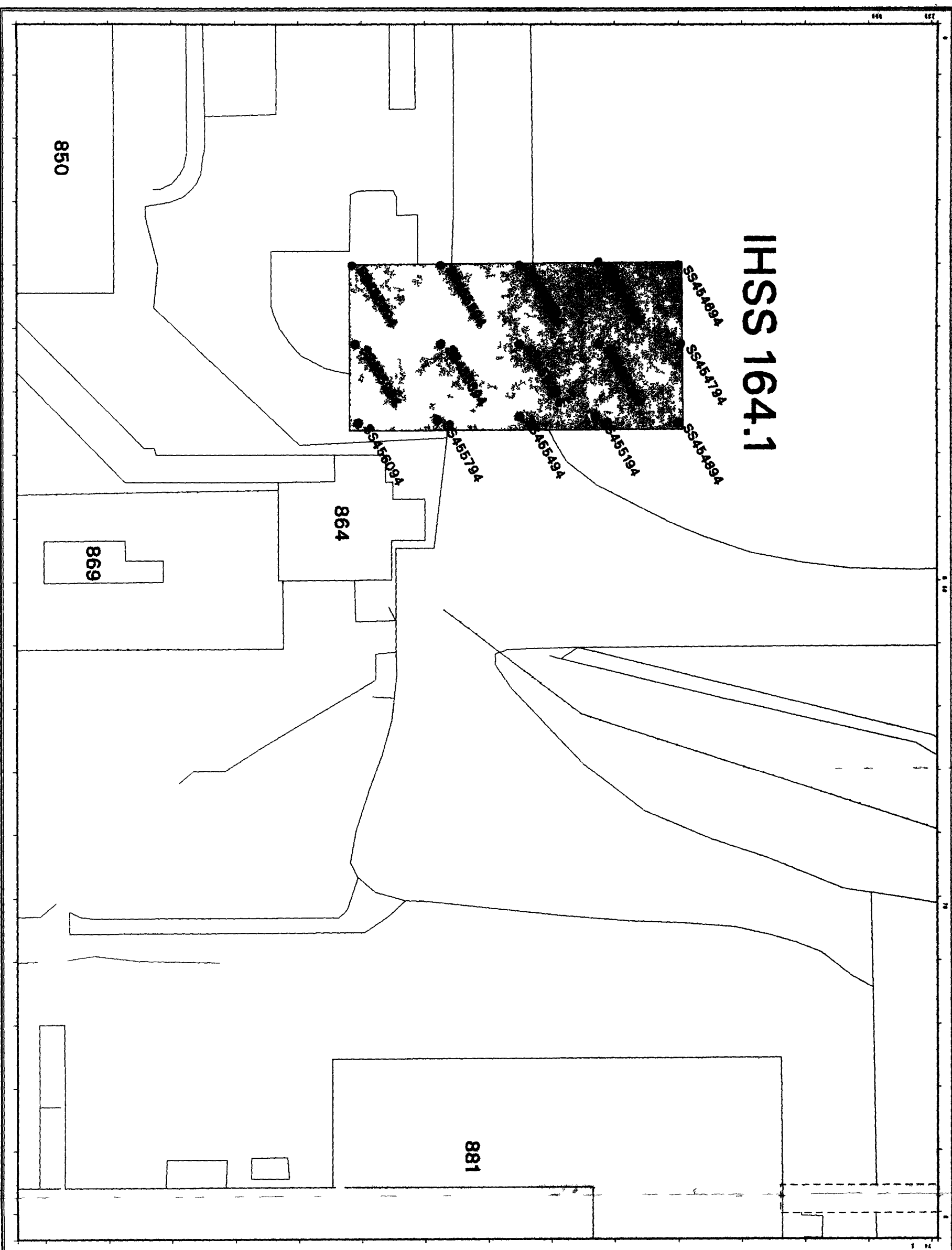
Prepared for

**DOE**  
KANSAS CITY

MAP ID: 24-0373/169 April

September 25, 2000

Figure 2.5  
Historical Release Report  
IHSS 600-164.1  
Surface-Soil Sample Locations



EXPLANATION

● Surface-Soil Sample Location

IHSS 164.1

Standard Map Features

- Buildings and other structures
- Streams, ditches, or their drainage features
- Fences and other barriers
- gravel roads
- dirt roads

DATA SOURCE STATE FEATURES

Buildings, fences, hydrography, roads and other structures from 1984 and 1990 maps derived by GIS/RS from 1:25,000 scale topographic maps, 1985

Data Source

Surface Soil data, Acquired by With Chemicals (WHS), 305-905-4035  
Individual Hazardous Substances, 305-905-4035  
Approved by Rick Dornes (HHS), 305-905-4035

U S Department of Energy  
Rocky Flats Environmental Technology Site

State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD27

Scale 1 360  
1 inch represents approximately 32 feet

Prepared by  
**DynCorp**  
Prepared for  
**KAISER HILL**

MAP ID: 2K-03726014 Ihss164-1.jmi  
September 25, 2000

Figure 2.6

Historical Release Report

IHSS 600-189

EXPLANATION

Proposed Sampling Location with Strategic Coordinate

IHSS 189

Standard Map Features

Buildings and other structures

Removed Buildings

Fences and other barriers

Paved roads

DATA SOURCE: BASE DATA

Buildings, fences, other structures, roads and other features were identified from aerial photographs and ground surveys. Data were obtained from the Department of the Interior, Bureau of Land Management, and the National Aeronautics and Space Administration. All IHSS and POC's boundaries are approximate. For more details, please consult the National Aeronautics and Space Administration, Historical Release Report (HRR) September 2000. Aerial Photo



Scale 1:80  
1 inch equals 80 feet



Site Name: Central 2  
Date: March 27, 2000

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by:

DynCorp

Prepared for:

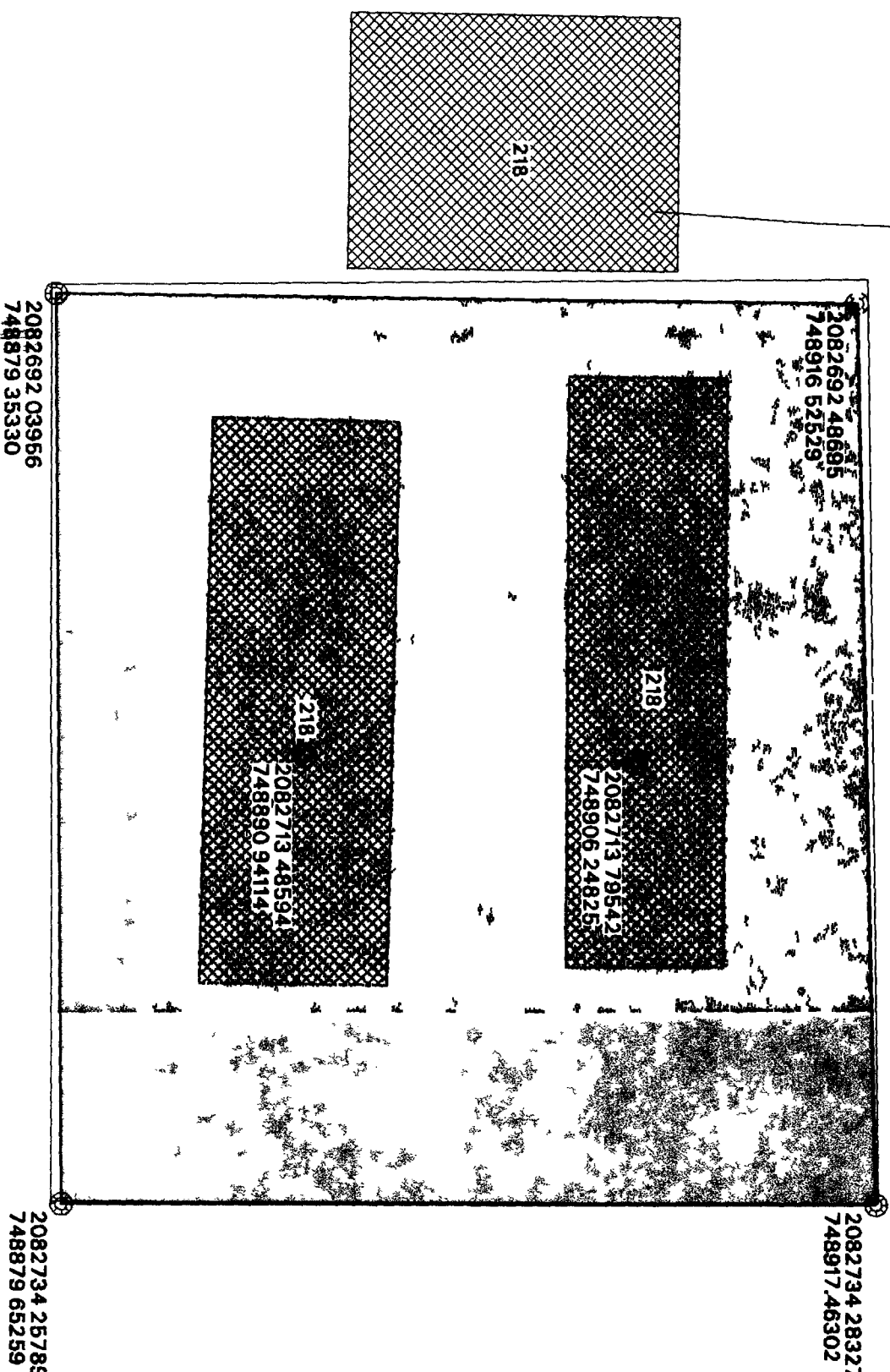


KAISER HILL

MAP ID: 2K-03/24/00/189.dwg

September 26, 2000

IHSS 189



52

Figure 2.7

Historical Release Report

IHSS 700-123.1

SURFACE-SOIL ANALYTICAL RESULTS FOR INORGANICS ORGANICS AND RADIONUCLIDES

EXPLANATION

Surface Soil Sample Location

Analyte elevated above background

Vertical Soil Profile Sample Location Data Provided in Appendix C.

IHSS 123.1

Standard Map Features

Buildings and other structures

Removed Buildings

Fences and the barriers

Panel roads

Dirt roads

AD Silver  
BAP Barium Iodine  
CA Calcium  
CU Copper  
MG Magnesium  
NA Sodium  
NI Nickel  
Pb Lead  
U Uranium  
Zn Zinc

Units:  
Mercury (mg/kg)  
Radionuclides (pCi/g)  
Organics (ug/kg)

Analytical results are indicated by the "harm" symbol, result, and threshold flag flags are

Positive detection above PRC

Positive detection above background

Estimated or qualified values are reported as such. Estimated values are indicated by a "J" symbol. Estimated values are reported as such. Estimated values are indicated by a "J" symbol.

DATA SOURCE MAP FEATURES

Buildings, fences, topography, roads and other structures from 8004 aerial fly-over data acquired in 1984 by the U.S. Army, Corps of Engineers, Fort Belvoir, St. Louis, MO. Digitized from the orthophotograph, 1985.

Scale: 1:50,000  
North arrow: 0° 00' 00"

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 83

U.S. Department of Energy  
Fy 1994 Environmental Technology Site

DynCorp

Kaiser Hill

Map ID: 200-01-01-01-01-01



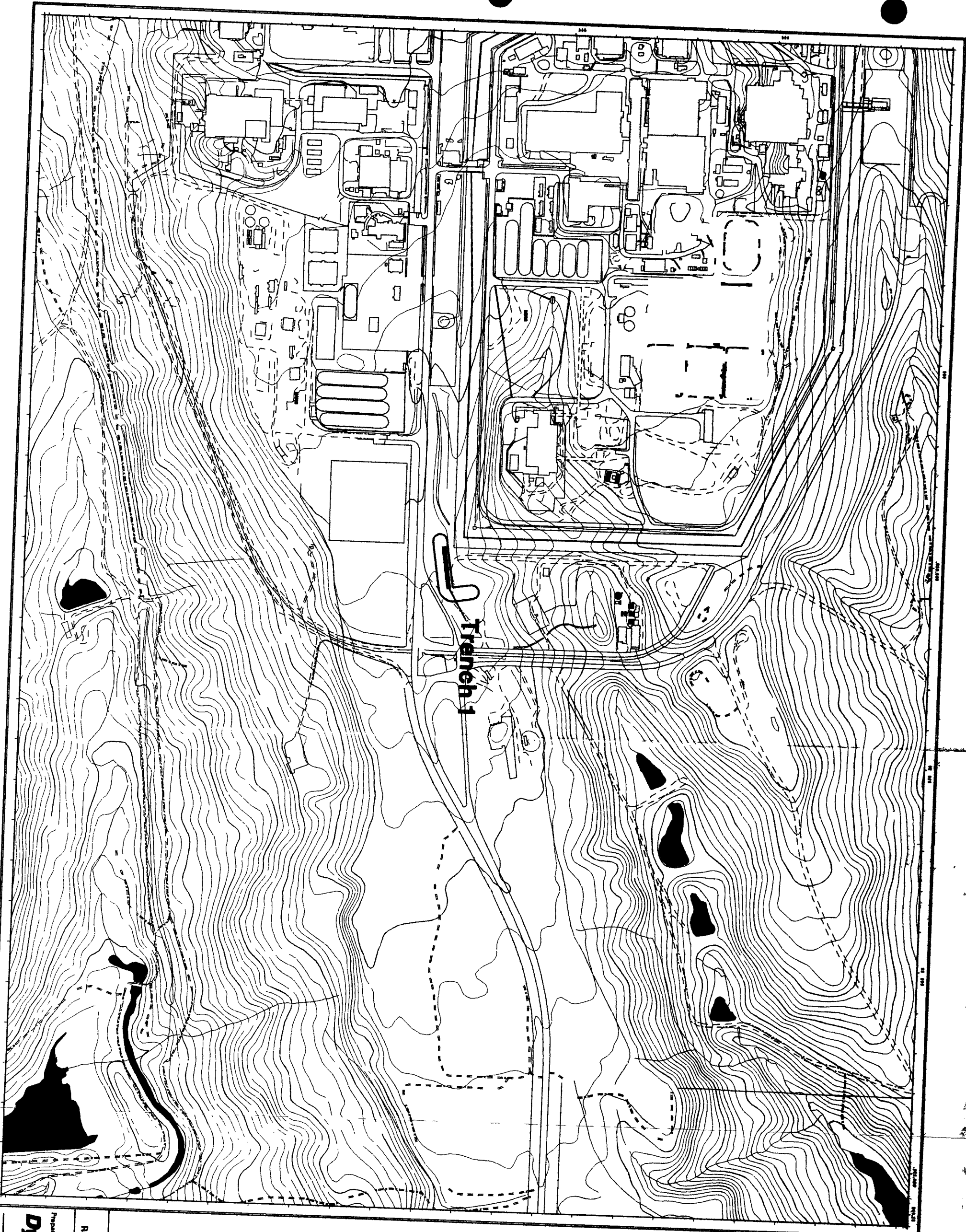


Figure 2.9

Historical Release Report

Trench 1  
Site Location

EXPLANATION

- Trench 1

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Contour (5-Foot)
- Paved roads
- Dirt road

NOTES:  
1. This map was prepared by the U.S. Department of Energy, Office of Environmental Research, and the U.S. Environmental Protection Agency, Office of Research and Development, for the purpose of providing information on the location of Trench 1 at the Rocky Flats Environmental Technology Site. The map was prepared by the U.S. Department of Energy, Office of Environmental Research, and the U.S. Environmental Protection Agency, Office of Research and Development, for the purpose of providing information on the location of Trench 1 at the Rocky Flats Environmental Technology Site. The map was prepared by the U.S. Department of Energy, Office of Environmental Research, and the U.S. Environmental Protection Agency, Office of Research and Development, for the purpose of providing information on the location of Trench 1 at the Rocky Flats Environmental Technology Site.

Scale: 1:50,000  
1 inch represents approximately 5 feet

State Plane Coordinate Projection  
Colorado State Zone  
Datum: NAD 83

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
DynCorp  
Prepared for  
Kaiser Hill




**Figure 2.10**  
**Historical Release Report**  
**Trench 1**  
**Excavation Verification**  
**and**  
**Sample Locations**

### EXPLANATION

- ✗ Location of 5-gal Container
- W Excavated Boundary
- Approx Trench Grid Location
- Tent Location
- Sample Location
- Sample + Duplicate

EB0201 = Sample Location  
062 = Alleviated Sample Number  
Representing 882511-062  
GS = Gas Chromatography Analysis  
V = Volatile Organic Compound Analysis  
CN = Cyanide Analysis  
P = PCBs  
W = Western Th d 120 Sample Cell  
C = Cant. Third 120 Sample Cell  
E = Eastern Th d 120 Sample Cell

## Standard Map Features

-  Fences and other barriers
-  Paved roads
-  Dirt roads

**DATA SOURCE NAME FEATURES.**  
Packaging, language, highlighting, marks and other  
attributes from SSID and lead by color dot  
underlined by ES&G ASL, Las Vegas.  
Physical forms for anthropomorphic SSID  
SS 108 Data also listed as key of the to  
be reviewed



Scale = 1" = 240'  
1 inch represent 20 feet



State Plane Coordinate Projection  
Colorado Cont. at Zone  
Datum NAD27

U S Department of Energy  
Rocky Flats Environmental Technology Site

**Prepared by**

**Prepared for:**

GIS Dept. 303-888-770

903 Pad

Central Avenue

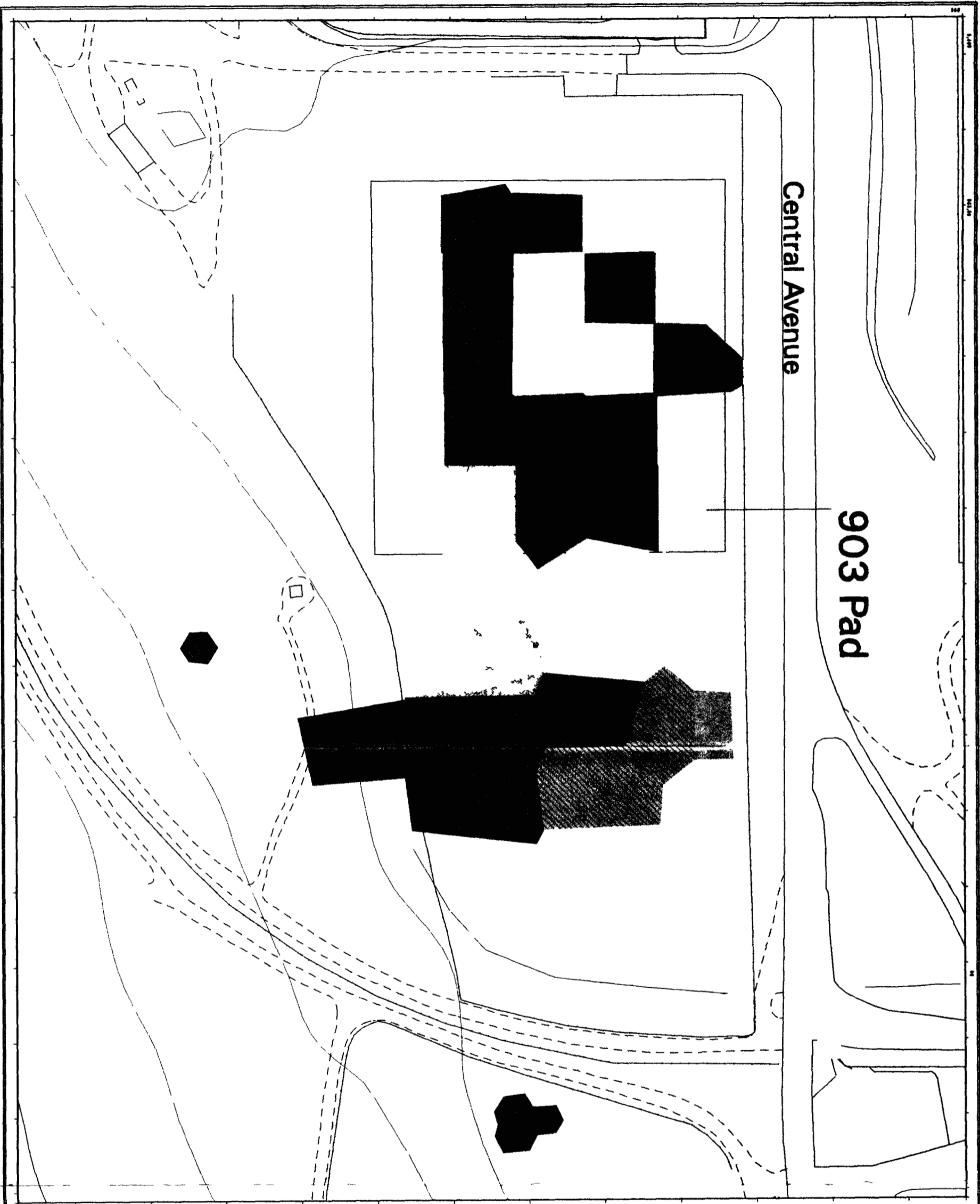


Figure 2.12

Historical Release Report

903 Drum Storage Area, 903 Lip Area  
and Ammunition Zone

DRAFT

Composite Map of  
Tier I RSAL Exceedances  
(Open Space)

EXPLANATION

- Native 1 (0-6 inches)
- Native 2 (6-12 inches)
- Native 1 and Native 2 (0-12 inches)

Standard Map Features

- Building and other structures
- Streams, ditches, or other drainage features
- Fences and other barriers
- Contour (20-Foot)
- Paved road
- Dirt road

DATA SOURCES AND REFERENCES:

Historical Release Report, 1997, and other sources. The map was prepared by the U.S. Department of Energy, Rocky Flats Environmental Technology Site, and the U.S. Environmental Protection Agency. The map was prepared by the U.S. Department of Energy, Rocky Flats Environmental Technology Site, and the U.S. Environmental Protection Agency. The map was prepared by the U.S. Department of Energy, Rocky Flats Environmental Technology Site, and the U.S. Environmental Protection Agency.

Scale 1:1280  
1 inch represents approximately 106 feet



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by:  
Date: Sept. 2004-05-7707

DynCorp

Kaiser Hill

MAP ID: Rk-0973



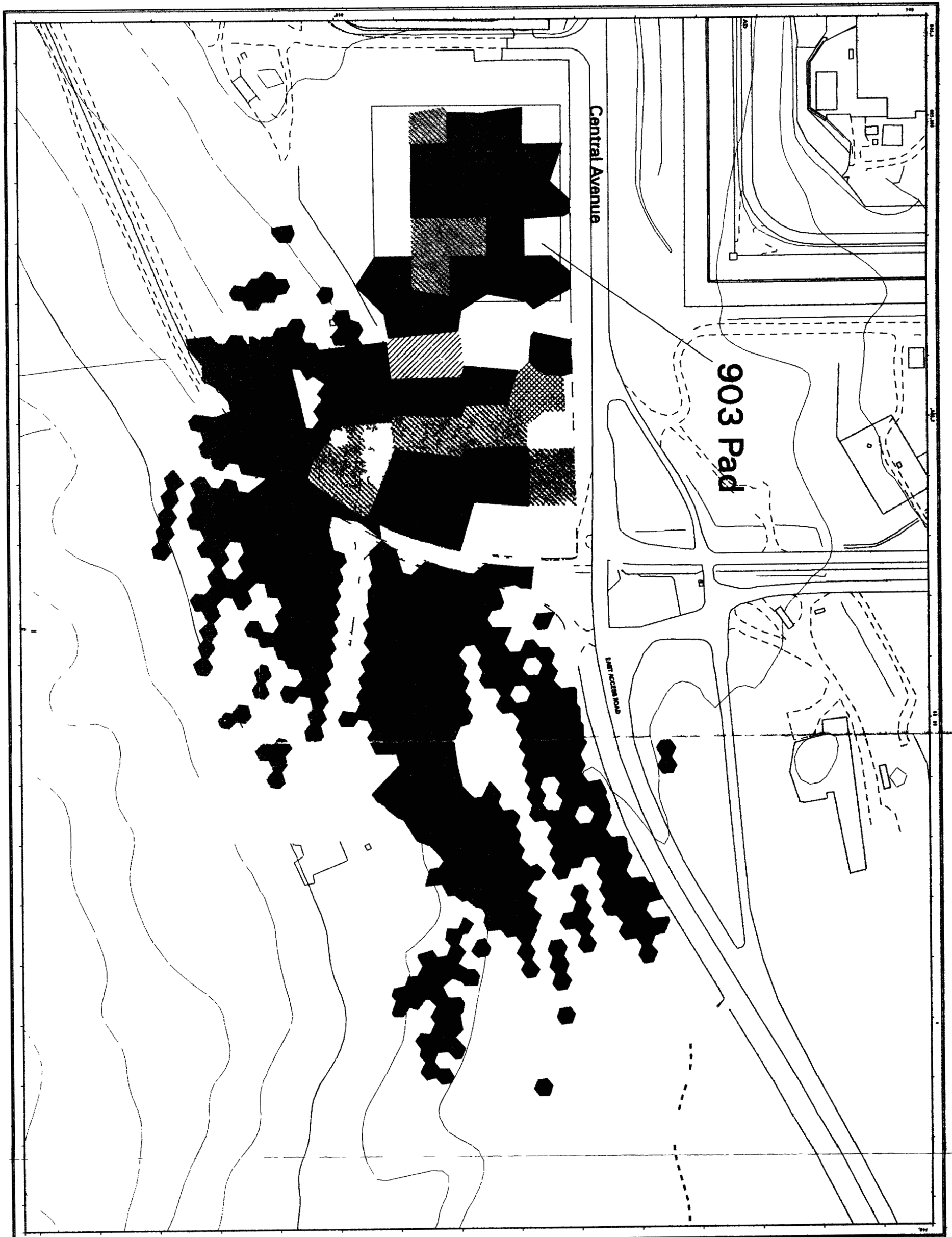


Figure 2.13

Historical Release Report

903 Drum Storage Area, 903 Llp Area  
and American Zone

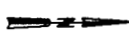
DRAFT

Composite Map of  
Tier II RSAL Exceedances

EXPLANATION

- Native 1 (0-6 inches)
- Native 2 (6-12 inches)
- Native 3 (12-18 inches)
- Native 1a and Native 2 (0-12 inches)
- Native 2 and Native 3 (6-18 inches)
- Native 1, Native 2 and Native 3 (0-18 inches)
- Standard Map Features
  - Buildings and other structures
  - Streams, ditches, or other drainage features
  - Fences and other barriers
  - Contour (20-Foot)
  - Paved road
  - Dirt road

DATA SOURCES AND METHODS:  
Background, historical, and other information was obtained from the following sources:  
1. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
2. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
3. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
4. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
5. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
6. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
7. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
8. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
9. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.  
10. U.S. Environmental Protection Agency (USEPA) National Environmental System (NES) data.



Scale  
1 inch represents approximately 0.4 miles  
0 0.4 0.8 1.2 1.6 2.0 miles  
State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 83

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
**DynCorp**



MAP ID: 26-0073






September 26, 2000

**Historical Release Report**  
**903 Drum Storage Area, 903 Lip Area**  
**and Ammunition Zone**

**1-800-900-1555**

## Composite Map of Tier II RSL Exceedances

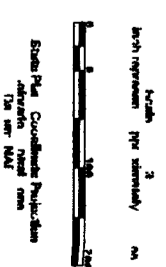
### EXPLANATION

-  Native 1 (0-6 inches)  
 Native 2 (6-12 inches)  
 Native 3 (12-18 inches)  
 Native 1 and Native 2  
     0-12 inches  
 Native 1 and Native 3  
     0-18 inches

## Standard Map Features

- ☐ Building and other structures

- Frances and other bare roads
- Contour (20 Feet)
- == Paved roads
- Dirt roads

[illegible]

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by

**DynCorp**

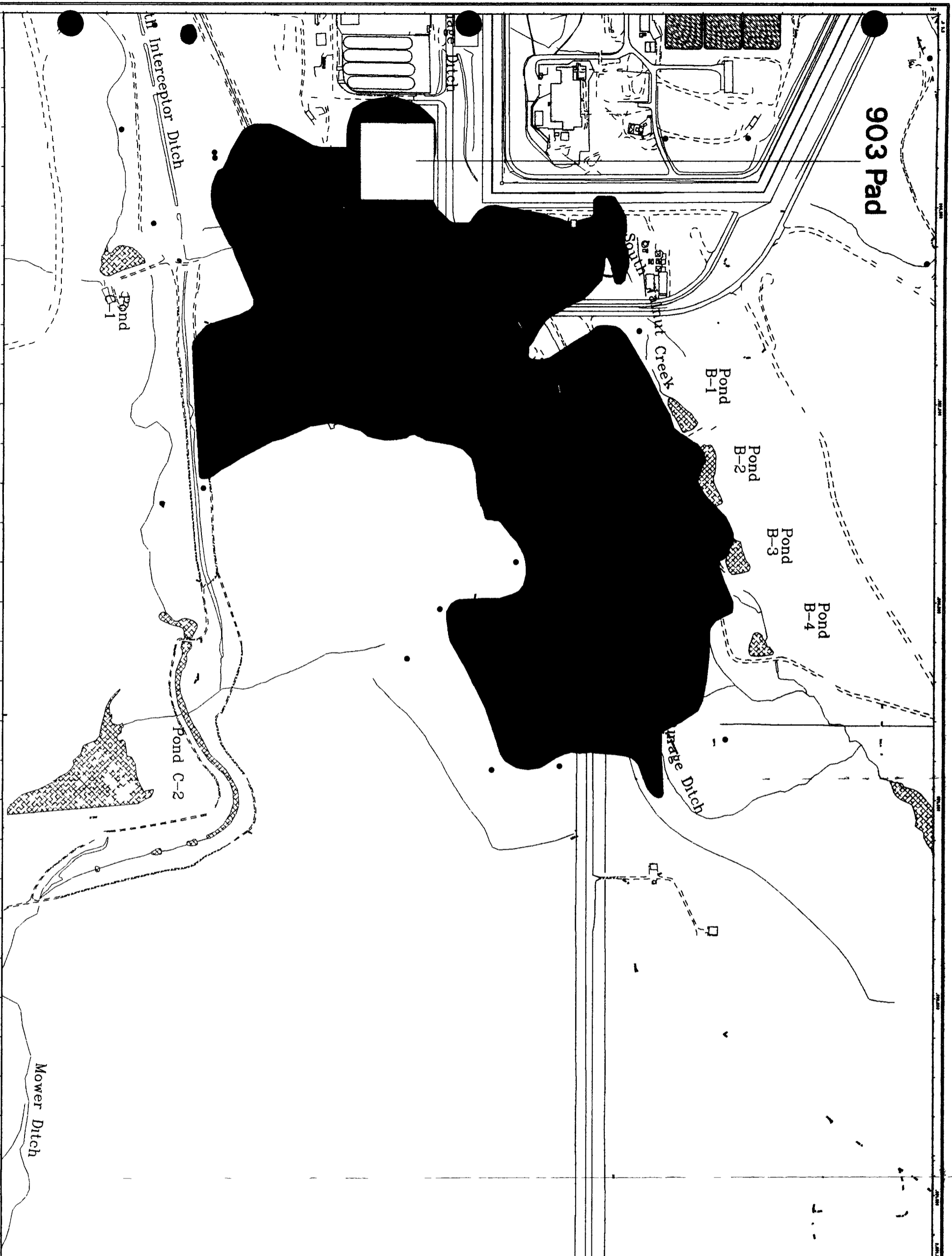
CTS Dept. 303-665-7703  
 Prepared by:



**KAISER HILL**

MAP D 26-0873

September 25, 2004



**Figure 2 14**  
**Historical Release Report**  
**Groundwater Plume Map**









**DRAFT**

**(1998 Data)**

**EXPLANATION**

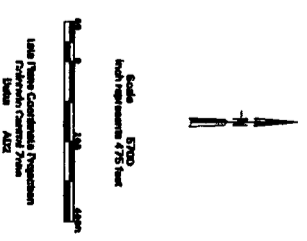
- Tier II Wall with Exceedance
- RRP Wall Locations
- Composita VOC (Groundwater Plume (concentrations equal to MCL))
- Composita VOC (Groundwater Plume (500 MCL))

## Standard Map Features

-  Building and other structures
-  Soils Evaporation Ponds (SEPs)
-  Lakes and ponds
-  Streams, ditches or other drainage features
-  Fences and other barriers
-  Rocky Flats boundary
-  Paved roads
-  Dirt road

### DATA SOURCE BASE FEATURES.

*Bullheads, tenues, hydrography, roads and other structures from 1954 aerial fly-over data captured by EROS NSL, Las Vegas. Digitized from the orthophotographs, 1955*



U S Department of Energy  
Rocky Flats Environmental Technology Site

CHS Dept. 303-666-7707

Prepared by:

Prepared for:

**DynCorp**

**KAISER HILL**

102

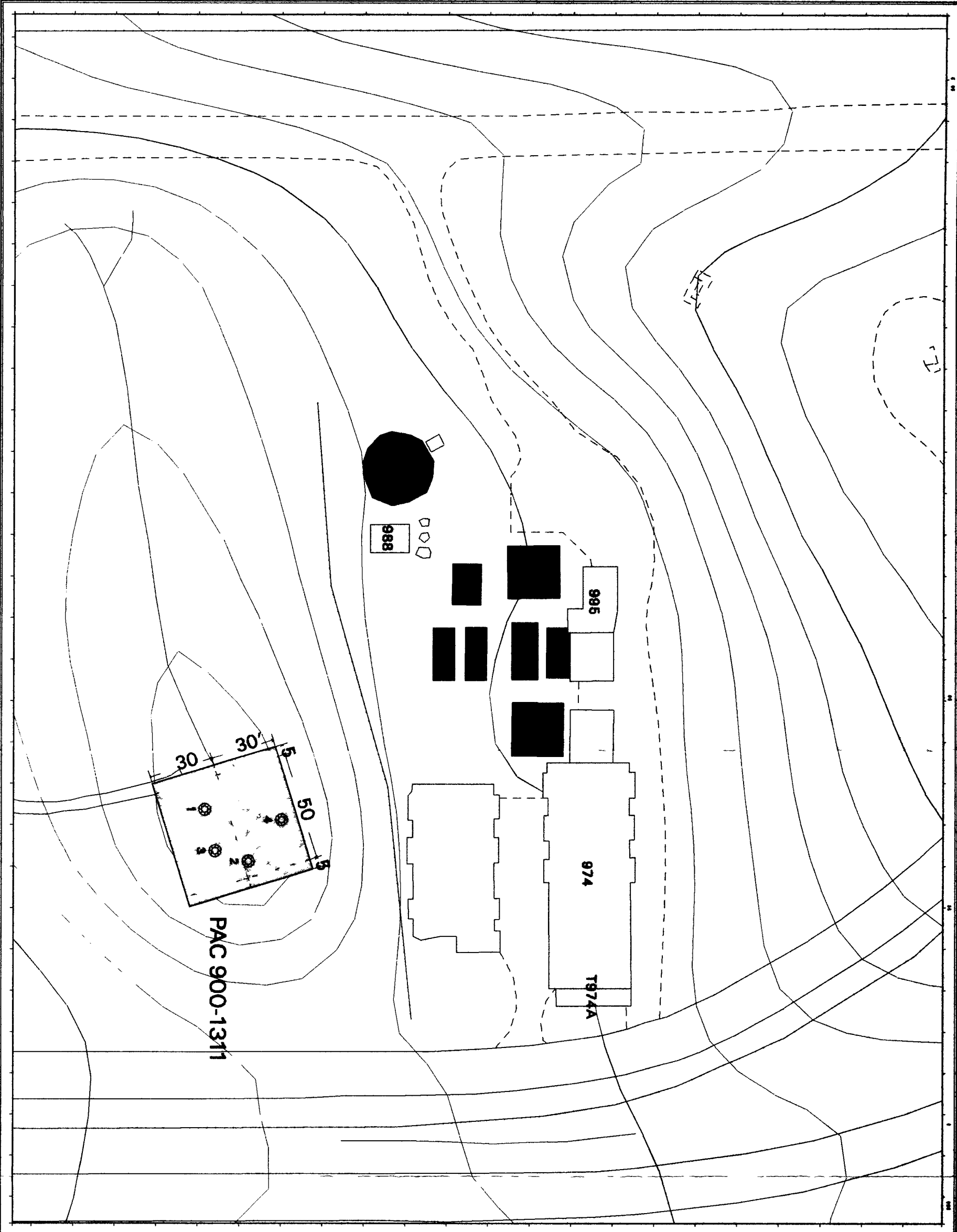
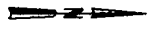


Figure 2.16

Historical Release Report  
Sample Location Map  
Potential Areas of Concern  
PAC 900-1311

- Potential Area of Concern
- Sampling Location/Borehole Location
- Sampling Grid
- PAC Boundary with Annotation
- Standard Map Features
  - Buildings and other structures
  - Lakes and ponds
  - Streams, ditches, or other drainage features
  - Fences and other barriers
  - Contour (5-foot)
  - Paved roads
  - Dirt roads
- Other features and structures



Scale 1:500  
1 inch represents approximately 4 feet



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
**DynCorp**  
Prepared to  
**Kaiser Hill**

MAP ID: 26-0373  
September 25, 2000

Figure A-3  
(Appendix 3)  
2000 Historical Release Report  
Non-RTCA Generated Soils  
Returned to Place of Origin

EXPLANATION

- Soil Purbuck Area  
Assigned NFA PAC Designation

Standard Map Features

- Buildings and other structures
- ▨ Soil Evaporation Ponds (SEP)
- Lakes and ponds
- Streams ditches or other drainage features
- Fences and other barriers
- == Paved roads
- - - Dirt roads

DATA SOURCE BASE FEATURES  
Buildings, fences, hydrography, roads and other features from 1994 aerial photograph data  
Soil Evaporation Ponds (SEP) from 1995  
Depicted from the orthorectified 1995



Scale = 1:4080  
1 inch represents approximately 341 feet



State Plane Co. dist. Projection  
Colorado Co. Trial Zone  
Datum: NAD27

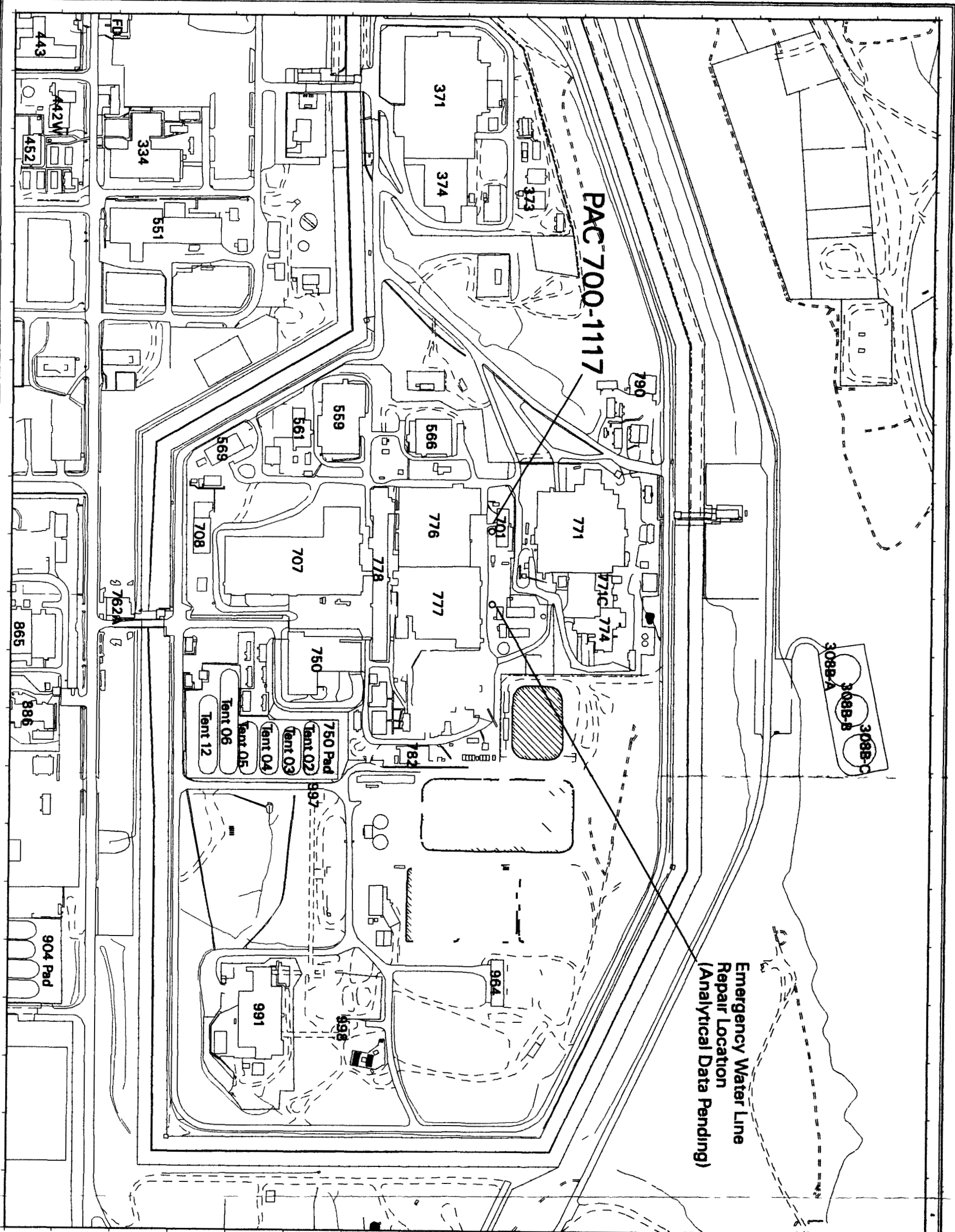
U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by  
**DynCorp**



Prepared to  
for DynCorp 200-200-7707

MAP ID: 2K-0373  
September 25, 2000



**Individual Hazardous  
Substance Sites by  
Consolidated Operable Unit**  
(As of Sept. 2000)

Industrial Area OU

 Buffer Zone OU

- Operable Unit 1  
Operable Unit 5  
Operable Unit 6  
Operable Unit 7

**NOTE:**

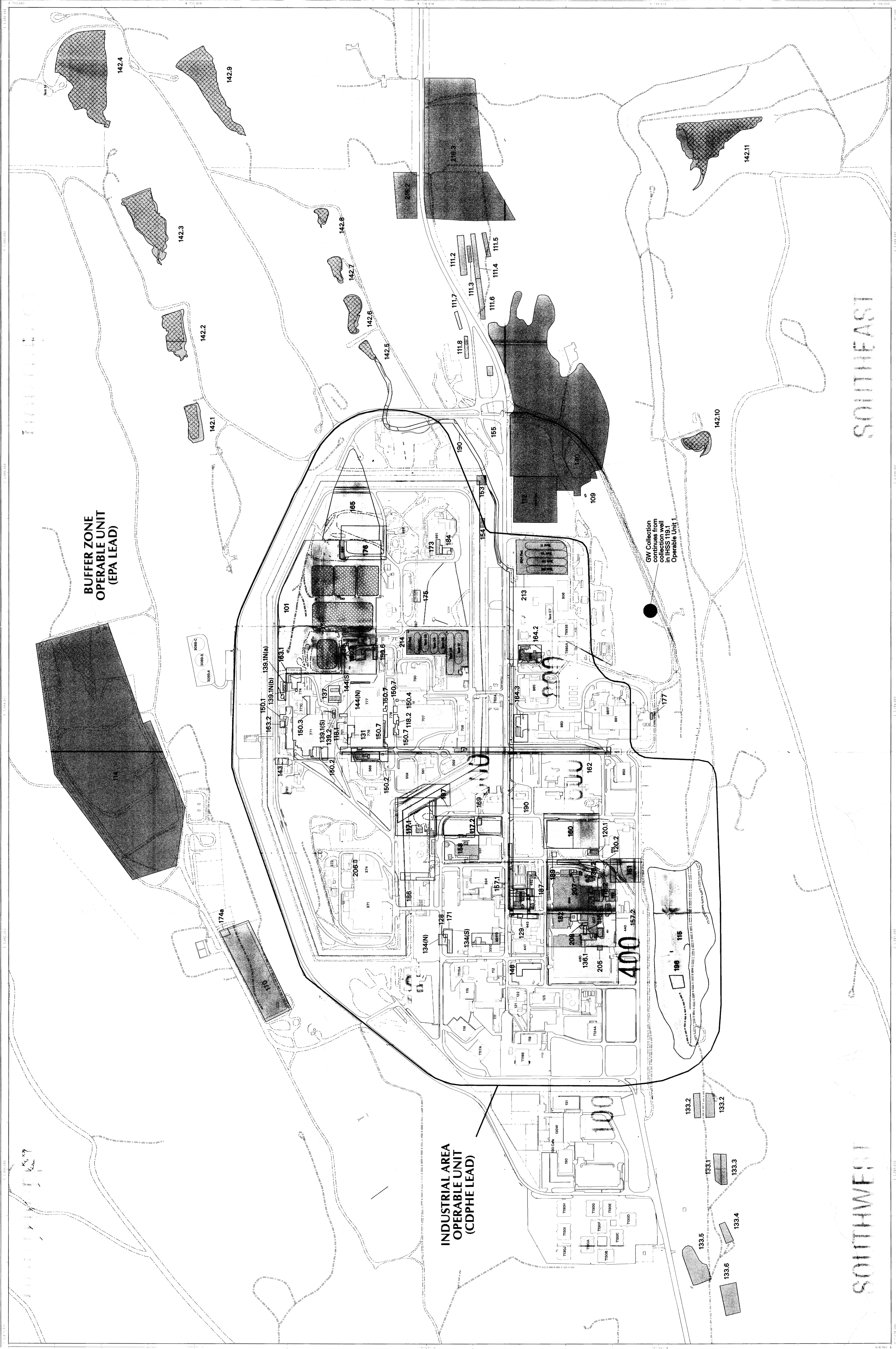
☐ Buildings and other structures

- Lakes and ponds  
Streams, ditches, or other  
drainage features  
Fences and other barriers  
Paved roads  
Dirt roads

- Industrial Area Operable Unit  
Boundary

HRR Designation Area Boundary

**DATA SOURCE BASE FEATURES:**  
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95 Individual Hazardous Substance Sites (IHSS) DOE 1992, HRR Report and Subsequent Updates.



THE

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:

Prepared by:

**DynCorp**

**THE ART OF TECHNOLOGY**

MAP ID: 2k-0373  
September 26, 2000

SW-A-004150

SW-A-004150



Plate 2

No Further Action  
Individual Hazardous Substance Sites  
and  
Potential Areas of Concern  
(Including Proposed NFAs)  
(As of Sept. 2000)

EXPLANATION

- Operable Unit 1 (Closed through CAD/ROD Process)
- Former Operable Unit 2
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Former Operable Unit 8
- Former Operable Unit 10
- Operable Unit 11 (Closed through CAD/ROD Process)
- Former Operable Unit 12
- Former Operable Unit 13
- Former Operable Unit 14
- Operable Unit 15 (Closed through CAD/ROD Process)
- Operable Unit 16 (Closed through CAD/ROD Process)

- Potential Area of Concern (Proposed as No Further Action)
- No Further Action PACs approved by Colorado Department of Health and EPA in 1992.

- Foamed & Stabilized Tanks (Source Removed - RCRA Interim Status)
- Industrial Area Operable Unit Boundary
- HRR Designation Area Boundary

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:  
Locations of the Operable Units and their associated boundaries were derived from the DOE 1992 - HRR Report and subsequent updates. Operable Units 15, 16, and 17 are designated to be NFAs by the Corrective Action Decision/Record of Decision (CAD/ROD). Buildings, fences, hydrography, roads and other features were derived from aerial photography data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 4800  
1 inch represents 400 feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:



MAP ID: 2K-0373

September 26, 2000

SW-H-004150

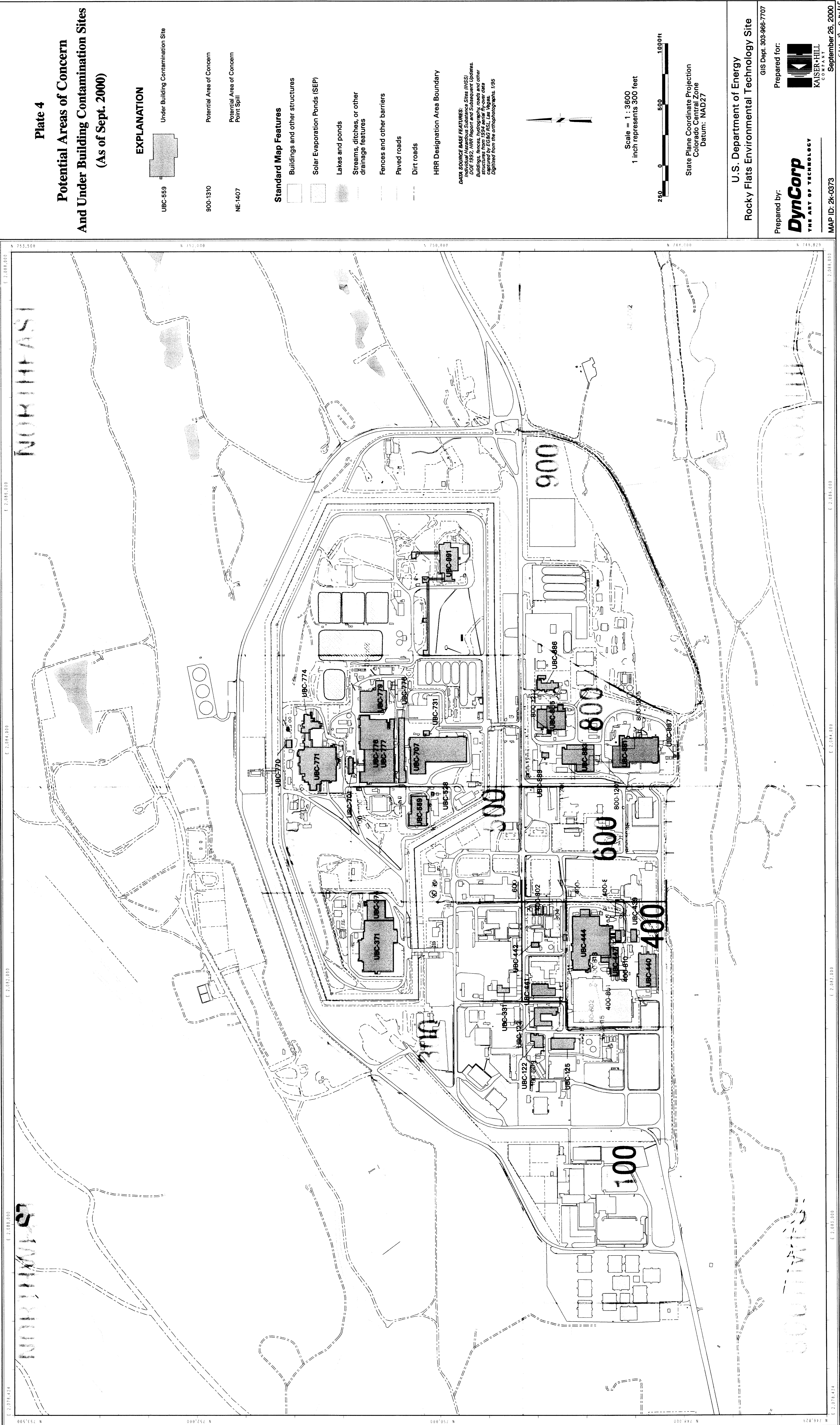


Plate 3

Historical Release Report  
Original Process Waste Lines  
and  
New Process Waste Lines  
(September 2000)

EXPLANATION

- Tanks of Concern
- Foamed & Stabilized Tanks  
(Source Removed - Interim Status)
- Remaining Tanks
- Process Waste IHSS Locations  
(Former OU 9 IHSSs)
- Original Process Waste Lines
- Location of Original Process  
Waste Lines which may have  
been removed.
- ... Pipe Currently in Use
- - - Pipe Made of Vitrified Clay
- Cannot Verify if Pipe Exists
- Leak Along the Pipe
- Pipe Failed Pressure Test
- Known Leaks
- Manholes
- Approximate Location of  
New Process Waste Lines
- Valve Vault Locations

NOTE:

Standard Map Features

- Buildings and other structures
- Demolished Buildings
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other  
drainage features
- Fences and other barriers
- Paved roads
- Underground Tunnels

DATA SOURCE: SAIC FIELDWORKS  
Individual Hazardous Substance Sites (IHSS)  
DOE 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000  
DOE 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000

Scale = 1" = 2480'

1 inch represents 205 feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD83

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:

**DynCorp**  
THE ART OF TECHNOLOGY



MAP ID: 26-0383

September 26, 2000

SW-A-004150